



POPULAR MECHANICS

MAGAZINE

WRITTEN SO YOU CAN UNDERSTAND IT

REG'D. TRADE MARK, GREAT BRITAIN, NO. 449428

REG. U.S. PAT. OFF.

*See
Nov 1960,
p. 16*



See page 104



In This Issue
HERE COMES THE CIRCUS
MAKE A FLIGHT BOW

Anniversary Feature
YOUR HOME -
1902 to 1952



Commander V-8 Starliner "hard-top" convertible.

Chrome wheel discs optional at extra cost—decorative and other specifications subject to change without notice.

See and drive the newest of the new

LOOK at the sweeping grace of line of this exciting Studebaker Starliner. Wouldn't you love to be going places in it right now?

Like a sleek, new-type jet plane, every 1952 Studebaker is free from burdensome excess bulk—and this saves gallon after gallon of gasoline for you.

The Starliner is one of many dramatically advanced 1952 Studebaker Champions and Commander V-8s.

Stop in and arrange to try one out at a nearby Studebaker dealer's showroom.



Sparkling with eye appeal—Studebaker's refreshingly styled new '52 Champion, or Commander V-8, four-door sedan.

See Studebaker for '52

Studebaker, South Bend 27, Indiana, U. S. A.



Install VINYL-TILE yourself

It's Pre-polished! Never needs waxing!

Yes! Quickly, cleanly, economically, you can install "The World's Most Beautiful Flooring" in any room in your home. And see it take on new beauty, *lasting* beauty! For this remarkable flooring comes to you pre-polished. It never needs waxing. That's right—*never!*

Equipment? Goodyear's special VINYL-TILE installation kit and adhesive are all you need to do

a complete flooring job.

See the twenty-four gorgeous colors—marbleized and solid—that distinguish VINYL-TILE. See the built-in luster that *only* VINYL-TILE has. See how it resists stains, scars, scratches and scrubbing off.

You can buy VINYL-TILE at better flooring dealers', furniture and department stores.

FREE "HOW-TO" BOOKLET

and color samples show how easily and economically you yourself can install VINYL-TILE in your home. Send for your copy today! Goodyear, Flooring Dept. 1-P, Akron 16, Ohio.

"World's Most Beautiful Flooring"

Vinyl-Tile by
GOOD YEAR

Makers of Wingfoot Rubber Flooring

Wingfoot—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

What
kind
of
men?



What kind of men are the 2500 scientists and engineers of Bell Telephone Laboratories?

They are men of many types, yet they work well together, for all have good minds as a foundation, years of study in the fundamentals of their science and in the methods of research and design. Vital, too, is their teamwork—for without the co-operation of many individuals the products of research and development could never be perfected.

Above all else these men have “the spirit to adventure, the wit to question, and the wisdom to accept and use.”

Such men can develop the world’s finest telephone systems — and have done so.

Perhaps there is a place among them for you. Write the Employment Director, Bell Telephone Laboratories, New York 14.



BELL TELEPHONE LABORATORIES

• EXPLORING AND INVENTING, DEVISING AND PERFECTING FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

Popular Mechanics Magazine

Registered in U. S. Patent Office and Canada

H. H. WINDSOR, Founder

H. H. WINDSOR, JR., Editor and Publisher



this month's cover

LOOK OUT! Everybody knows a plane can't fly without wings. That is, everybody but the pilot of that dive bomber on our cover, who apparently thinks he can fly on a revved-up engine and a prayer. Truth is, he forgot to fold down the wings of his carrier plane before heading down the runway of an air station. Aviators will argue that it simply can't be done, but this befuddled flyer managed to lift the 20,000-pound plane 250 feet into the air before it went into a spin and crashed. This is just one of the tall—but true—tales spun by today's "hangar flyers" when fog shrouds flight decks and landing strips. Ever hear of the helicopter that rescued a pilot while his crashed plane was still on the deck of its own carrier? Or the pilot who used his carrier plane's tail hook as a weapon in Korea? These are just two of the tall tales starting on page 104

Published monthly by Popular Mechanics Company, 200 E. Ontario St., Chicago 11, Ill. H. H. Windsor, Jr., president; William Harrison Fetridge, vice-president; D. F. Windsor, vice-president and secretary-treasurer; H. H. Windsor III, vice-president; Clover L. Perkins, advertising manager; Alan M. Doyce, circulation manager. Single copy in the United States and Canada, 33 cents; subscription rates in United States and possessions, Canada, Philippines and countries of the Pan-American Postal Union, 1 year, \$3.50; 2 years, \$6.00; 3 years, \$8.00. To all other countries add \$1.00 a year over United States prices for overseas postage. If you plan to move, notify us at least 30 days in advance so you will not miss an issue. Give both your old and new addresses. Entered as Second Class Matter, September 15, 1903, at the Post Office at Chicago, Illinois, under Act of March 3, 1879. Entered as Second Class Matter at Post Office Dept., Canada. Registered as Second Class Matter at the Post Office at Mexico, D. F., Mexico, June 20, 1950. Copyright 1952 by Popular Mechanics Company. Copyright under International Copyright Union. Copyright in France. All rights reserved under Pan-American Copyright Union. Printed in the United States of America.

MAY 1952

Volume 97

MAY 1952

Number 5

Address all communications to:
200 East Ontario Street, Chicago 11, Illinois

Managing Editor.....Roderick M. Grant
Assistant Managing Editor.....Wayne Whittaker
Shop Notes and Crafts Editor.....James R. Ward
Radio-Television, Electronics Editor.....Frank L. Brittin
Associate Editor, Aviation.....Aubrey O. Cookman, Jr.
Associate Editor.....Clifford B. Hicks
Assistant Shop Notes and Crafts Editor.....Wayne C. Lecky
Automotive Editor.....Siler Freeman
Art Director.....Frank Beatty

Assistant Editors
W. Clyde Lamney Frank N. Stephany Arthur R. Railton
Carlton H. Ihde Theodore A. Daum Elsie L. Domin
Elliott H. McCleary

Eastern Editor.....Richard F. Dampewolff
Empire State Bldg., Room 2906, New York 1, N. Y.

Western Editor.....Thomas E. Stimson, Jr.
302 23rd St., Santa Monica, Calif.

London Manager.....Douglas W. Wedderspoon
77 Baker St., London W. 1, England

Director, Bureau of Information.....Allan Carpenter
200 E. Ontario St., Chicago 11

IN THIS ISSUE

The Richest Hole in the Mountain	- - - -	65
Models Teach Our Fighting Men	- - - -	72
Here Comes the Circus	- - - -	81
The Owners Report on the 1952 Pontiac	- - - -	90
Your Home—1902 to 1952	- - - -	97
Tall Tales From Korean Skies	- - - -	104
Feathered Racers on the Beam	- - - -	117
What's New for Your Home	- - - -	124
He'll Win the Speedway on the Turns	- - - -	126
How to Keep Fit at 50	- - - -	136
There's a Knack to Mountain Driving	- - - -	142

For the Craftsman

Restoring Faded Tapestries	- - - -	149
Plywood Dinette Ensemble	- - - -	150
How to Make a Flight Bow	- - - -	180
Shopping for Tools	- - - -	184E
Know Your Car's Nervous System	- - - -	186
16-mm. Movie-Film Viewer	- - - -	191
Keep Your Jointer Sharp	- - - -	195
Thread Dial Indicator and Cross-Slide Stop	- - - -	200
Shadow Comparator	- - - -	204
Radio, TV and Electronics	- - - -	211
Clinic for Homemakers	- - - -	222

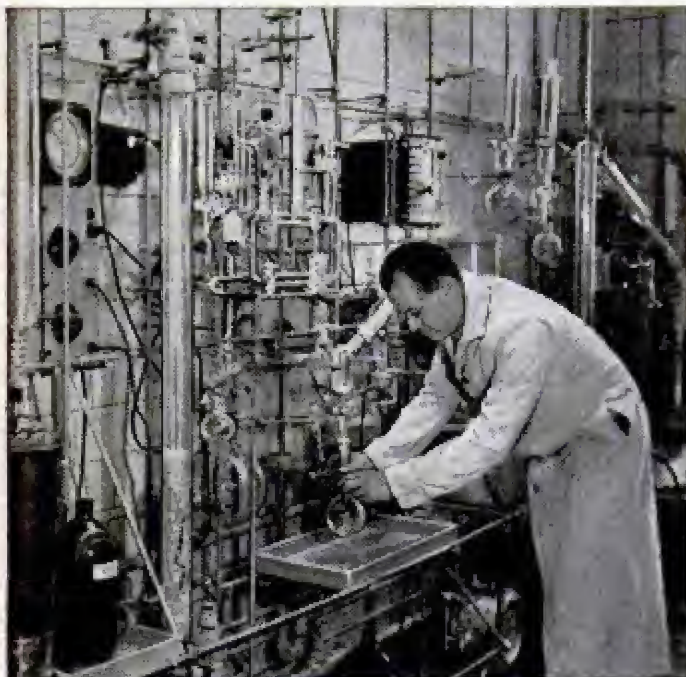
Other items, and manufacturers of available products described, are listed on pages 12, 14 and 16

These Great Laboratory



PETROCHEMICALS offer independent inventors great opportunity. Such synthetics as Nylon, Vinylite, Neolite are already indispensable to our expand-

ing economy—and new ideas in this area are at a premium today. If you have such an idea, the Sinclair Plan may help you develop it.



UNDER THE SINCLAIR PLAN, chemistry laboratories like these are now open to independent inventors.



ELECTRON MICROSCOPE, capable of magnifying 100,000 times, is typical of the equipment available.

Facilities Are Open to You

Many inventive people have responded to the Sinclair Plan's offer of laboratory facilities—to others who wish to do so, a suggestion: There is promise and profit in oil-based synthetics.

EIGHT months ago, Sinclair turned over a part of its great laboratories at Harvey, Illinois, to independent inventors who had promising ideas in the field of petroleum products but who did not have the facilities needed to develop or prove out their ideas.

To date nearly 5,000 people have submitted ideas to the laboratories, and the Plan is recognized as a valuable service to independent inventors. As a result we have made the Sinclair Plan part and parcel of the long-range operation of our company.

There may be inventive people interested in this Plan but wondering what sort of ideas or what areas would be profitable to explore. *To those people we suggest the field of petrochemicals. Such things as plastics, synthetics and new materials made from petroleum offer great opportunities for invention and reward.*

If you have an idea of this sort—or in the general area of petroleum products or applications—you are invited to submit it to the Sinclair Research Laboratories. In your own interest,

each idea must first be protected by a patent application or a patent.

The inventor's idea remains his own property

If the laboratories select your idea, they will make a very simple arrangement with you: In return for the laboratories' work, Sinclair will receive the privilege of using the idea for its own companies, free from royalties.

This agreement in no way hinders the inventor from selling his idea to any of the hundreds of other oil companies for whatever he can get. Sinclair has *no control* over the inventor's sale of his idea to others, and has *no participation* in any of the inventor's profits.

HOW TO PARTICIPATE: Instructions are contained in an Inventor's Booklet available on request. Write to: W. M. Flowers, Executive Vice-President, Sinclair Research Laboratories, Inc., 600 Fifth Avenue, New York 20, N. Y.

IMPORTANT: *Please do not send in any ideas until you have sent for and received the instructions.*



SINCLAIR RESEARCH LABORATORIES—nine buildings containing the most modern testing equipment known—have contributed many of today's most important

developments in petroleum. Under the Sinclair Plan, part of these laboratories is available to work on the promising ideas of independent inventors.

SINCLAIR—for Progress

FOR SMOOTHER ADMINISTRATION OF YOUR CAR...

vote for

PYROIL

Here's the Pyroil platform — with a promise to bring you greater driving satisfaction for years.

- Eliminate "high taxation" on your motor, caused by exposure and condensation.
- Assurance of "grime prevention". Pyroil cleans your motor, and keeps it clean.
- Prevent friction of piston rings and cylinder walls.
- Reduce the high cost of repair bills.
- Improve lubrication.

Pyroil contains the special property of making ordinary oil cling to exposed metal surfaces. It keeps your motor lubricated at all times.

For smoother administration of your car — add Pyroil — add miles to your car.

Pyroil for Aircraft Engines

Use Aircraft Pyroil B for lubricating oil. Aircraft Pyroil A for gasoline.

GIVEN! An attractive Pyroil metal savings bank—takes coins up to 50¢ pieces. **MOTORISTS**, it's yours for the asking—sent postage paid.



Manufactured and Guaranteed by Pyroil Company, 129 Pyroil Bldg., La Crosse, Wisconsin.

Canadian Distributors: Central Purchasing Agencies, Ltd., Toronto, Ontario

PYROIL COMPANY
129 Pyroil Bldg., La Crosse, Wisconsin

I want my car to last and run properly. Please tell me more about Pyroil and how it can accomplish this for me.

Name _____

Address _____

City or Town _____ State _____



in this corner.....

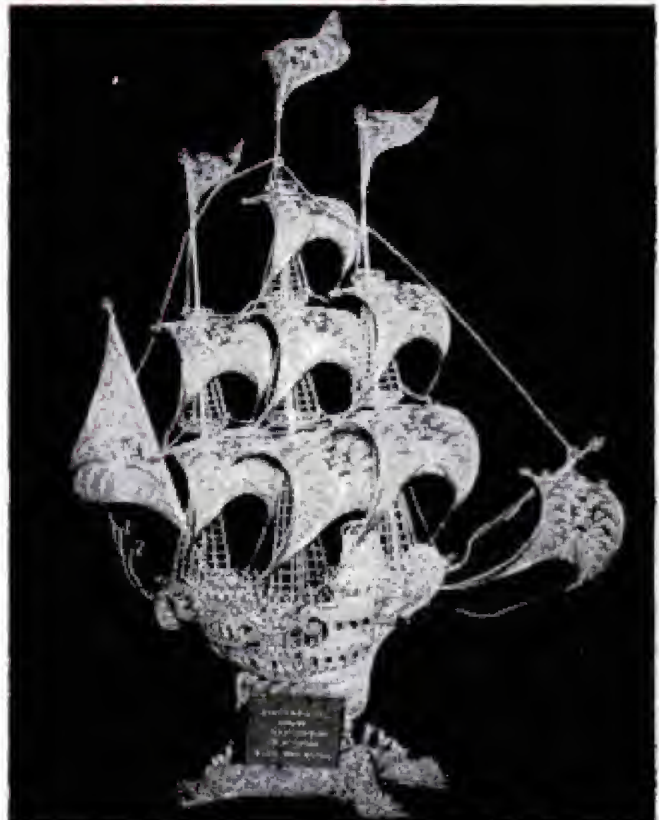
THE EDITORS



Golden Gift

One of the most beautiful gifts we received during our Golden Anniversary celebration in January was a golden caravel presented to *Popular Mechanics* by Alvaro Goncalves Pereira, magazine distributor in Lisbon, Portugal. It was made

Restauradores 13,

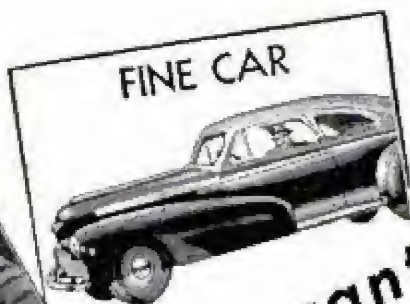
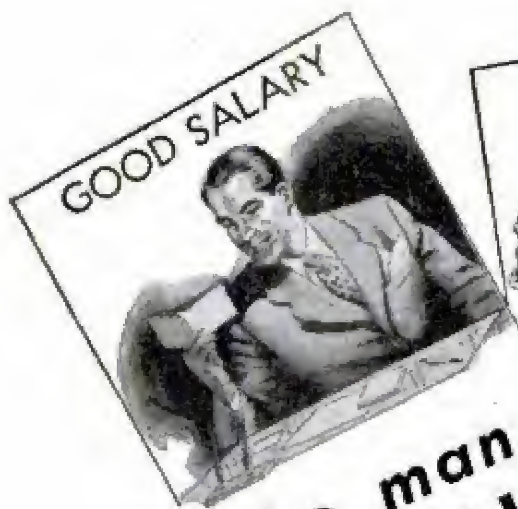


of silver wires wound into rosettes and spirals by Portuguese women using small pliers. Each sail or other part was then soldered in place by a jeweler and, finally, the whole caravel was gilded. The ship, which is 24 inches high, took three months to build.

A House to Make Life Easy

When a writer of science fiction builds a house, it is certain to be a modern one. Robert A. Heinlein of Colorado Springs, who wrote the movie "Destination Moon" and several current science stories, decided that his home would have to take care of itself. You'll see the result in our June issue—"A House to Make Life Easy." The house has no rugs. Its windows are sealed—its indoor climate manufactured for summer or winter comfort. Its dining table commutes between kitchen and dining

(Continued to page 8)



To the man who wants to enjoy
an ACCOUNTANT'S CAREER



IF you're that man, here's something that will interest you.

Not a magic formula—not a get-rich-quick scheme—but something more substantial, more practical.

Of course, you need something more than just the desire to be an accountant. You've got to pay the price—be willing to study earnestly, thoroughly.

Still, wouldn't it be worth your while to sacrifice some of your leisure in favor of interesting home study—over a comparatively brief period? Always provided that the rewards were good—a salary of \$4,000 to \$10,000?

An accountant's duties are interesting, varied and of real worth to his employers. He has *standing!*

Do you feel that such things aren't for you? Well, don't be too sure. Very possibly they *can* be!

Why not, like so many before you, investigate LaSalle's modern Problem Method of training for an accountancy position?

Just suppose you were permitted to work in a large accounting house under the personal supervision of an expert accountant. Suppose, with his aid, you studied accounting principles and solved problems day by day—easy ones at first—then more difficult ones. If you could do this—and could turn to him for advice as the problems became complex—soon you'd master them all.

That's the training you follow in principle under the LaSalle Problem Method.

You cover accountancy from the basic Principles right up through Accountancy Systems and Income Tax Procedure. Then you add C. P. A. Training and prepare for the C. P. A. examinations.

As you go along, you absorb the principles of Auditing, Cost Accounting, Business Law, Statistical Control, Organization, Management and Finance.

Your progress is as speedy as you care to make it—depending on your own eagerness to learn and the time you spend in study.

Will recognition come? The only answer, as you know, is that success *does* come to the man who is really *trained*. It's possible your employers will notice your improvement in a very few weeks or months. Indeed, many LaSalle graduates have paid for their training—with increased earnings—before they have completed it! For accountants, who are trained in organization and management, are the executives of the future.

Write For This Free Book

For your own good, don't put off investigation of *all* the facts. Write for our free 48-page book, "Accountancy, The Profession That Pays." It'll prove that accountancy offers brilliant futures to those who aren't afraid of serious home study. We'll also include "Ten Years' Promotion in One"—a book which has helped many men. Send us the coupon *now*.

Over 3200 Certified
 Public Accountants among
 LaSalle alumni

**LASALLE EXTENSION
 CHICAGO 5, ILL.**

- Other LaSalle Opportunities**
- Higher Accountancy
 - C.P.A. Coaching
 - Bookkeeping
 - Law: LL.B. Degree
 - Business Management
 - Salesmanship
 - Traffic Management
 - Foremanship
 - Industr'l Management
 - Stenotypy
 (Machine Shorthand)

LASALLE EXTENSION UNIVERSITY A CORRESPONDENCE INSTITUTION

417 S. Dearborn St. Dept. 564 HR Chicago 5, Ill.

I want to be an accountant. Send me with any, the Profession that Pays"—also "Ten

Name.....
 Address.....
 City, Zone & State.....



This One



XYAJ-ABL-T229



EMBRY-RIDDLE MEN OF THE HOUR

are moving UP!

Thousands of Embry-Riddle trained engineers, mechanics, specialists and pilots are making rapid strides in today's booming aviation industry.

These men in the top jobs are undeniably proving that thorough, practical Embry-Riddle training is by far your quickest, surest road to success in aviation. Complete eight-month to two-year Embry-Riddle courses are tailored to practical aviation industry requirements.

The latest, most modern equipment (including jet engines), the finest instructors, the most complete aviation school campus anywhere, are all yours at Embry-Riddle.

If you are now a high school student, a graduate or a veteran, investigate at once the full advantages and tremendous career security of Embry-Riddle training.

If military service interrupts your studies, you're still a long way ahead of the crowd.

Join the Embry-Riddle Men of the Hour. Write for full information today.

4 Keys to Success!

AIRCRAFT & ENGINE MECHANICS

Our C. A. A.-approved school has a quarter-century aviation training experience. Learn fast with modern equipment, including jet... live aircraft, airline-size hangars.

AERONAUTICAL DESIGN AND TECHNOLOGY

Embry-Riddle's accelerated 26-mo. Aeronautical Design and Technology Course provides finest training available.

A & E COMBINED WITH COMMERCIAL

Embry-Riddle combination training gives you unusual dual pilot-engineering ability.

COMMERCIAL PILOT

Benefit from our experience with 30,000 students... best instructors and aircraft, year-round flying weather.

Embry-Riddle

International

SCHOOL OF AVIATION

MIAMI 30, FLORIDA

CLASSES BEGINNING NOW - SEND COUPON TODAY!

Dean of Enrollments - Dept 99
Embry-Riddle School of Aviation
MIAMI 30, FLORIDA
Please Print

NAME _____

ADDRESS _____

City _____

State _____ Age _____

I am interested in...

- A.&E. Mechanic
- Commercial Pilot
- Aeronautical Design and Technology
- A.&E. Combined with Commercial Pilot
- Flying Mechanic

Check Veteran
Our Non-Veteran

TRAIN IN MIAMI - AIR CAPITAL OF THE WORLD

(Continued from page 6)

space on wheels. The furniture is part of the house. If you're interested in modern living, don't fail to read the article next month.

Letter to the Editor

I wonder if you got the full significance of that prize-winning picture ("Family Album" by Sallie Sawyer Smith). Our son, a Navy veteran and a polio victim in Novem-



ber 1949, with seven months in an iron lung, was home on his first week end to see his three-week-old son for the first time. His father is taking a picture and his devoted sister snapped the one you published.

We feel your judges are to be complimented for their selections.

Louise Sawyer Smith.

Guided Missiles Have Air Bearings

To the Editor: There is a tale from the Harz Mountains in Germany about a man who built a clockwork leg to replace one he had lost. He wound this clockwork leg and it started him walking around. But he had not figured a way to turn it off, and even to this day (according to the tale) you can see his skeleton when the night is windy and dark—and if the lightning flashes just right—walking around with a clockwork leg in the forests and along the dikes.

The mechanical ingenuity shown by precision workmen and engineers working in the guided-missile field is an interesting story, too. For example, in long-range guided missiles, extremely sensitive gyro mechanisms are needed in order to assure that the expensive weapons land in close proximity to the target, often several thousand miles distant.

The precession axes of these gyros are "air bearings" which have as a lubricant a film of air .001 inch thick. The bearing surfaces must be dustfree and so perfect that

(Continued to page 10)



This story actually happened. The man's name has been changed and this is not his photograph, but the facts are true.

Everybody liked Dick Gray. He was a man's man. A star athlete. A whiz of a basketball player. A good husband. A hard worker.

But with all those interests, Dick Gray had a busy day every day. And Dick Gray was ambitious. He *could* study at a local college nights, but that would take hours of commuting. That's when a friend told Dick about I.C.S. and how he could study at home in his spare time.

Moving Up Fast...

Since then, Dick has completed three I.C.S. courses in jig-time. He's moving up fast in the company for which he works. And he's kind enough to say he owes it to I.C.S. Sure, we helped, but Dick Gray really owes his success to Dick Gray.

On the rolls of I.C.S. under many different names there are thousands of "Dick Grays." Maybe you are one. If not, it just takes your name on this coupon to put it there!

INTERNATIONAL CORRESPONDENCE SCHOOLS



BOX 5526-L, Scranton 9, Penna.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> Business Courses | <input type="checkbox"/> Refrigeration, Domestic | <input type="checkbox"/> Communications Courses | <input type="checkbox"/> Ship Drafting |
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Refrigeration & Air Conditioning | <input type="checkbox"/> Telegraphy | <input type="checkbox"/> Ship Fitting |
| <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> Steam Fitting | <input type="checkbox"/> Telephony | <input type="checkbox"/> Tool Designing |
| <input type="checkbox"/> Business Administration | <input type="checkbox"/> Architecture | <input type="checkbox"/> Electrical Courses | <input type="checkbox"/> Welding—Gas and Electric |
| <input type="checkbox"/> Business Correspondence | <input type="checkbox"/> Architectural Drafting | <input type="checkbox"/> Electrical Drafting | <input type="checkbox"/> Radio Courses |
| <input type="checkbox"/> Business Law | <input type="checkbox"/> Architectural Estimating | <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Electronics |
| <input type="checkbox"/> Certified Public Accounting | <input type="checkbox"/> Building Estimating | <input type="checkbox"/> Electric Light and Power | <input type="checkbox"/> FM and Television Servicing |
| <input type="checkbox"/> Commercial | <input type="checkbox"/> Contractor's Building | <input type="checkbox"/> Lighting Technician | <input type="checkbox"/> Radio, General |
| <input type="checkbox"/> Federal Tax | <input type="checkbox"/> House Planning | <input type="checkbox"/> Power House Electric | <input type="checkbox"/> Radio Operating |
| <input type="checkbox"/> High School and College | <input type="checkbox"/> Art Courses | <input type="checkbox"/> Practical Electrician | <input type="checkbox"/> Radio Servicing |
| <input type="checkbox"/> Industrial Supervision | <input type="checkbox"/> Commercial Art | <input type="checkbox"/> Practical Lineman | <input type="checkbox"/> Railroad Courses |
| <input type="checkbox"/> Motor Traffic | <input type="checkbox"/> Magazine Illustrating | <input type="checkbox"/> Diesel Engines | <input type="checkbox"/> Car Inspector and Air Brake |
| <input type="checkbox"/> Personnel—Labor Relations | <input type="checkbox"/> Show Card and Sign Lettering | <input type="checkbox"/> Internal Combustion Engines | <input type="checkbox"/> Diesel Locomotive |
| <input type="checkbox"/> Postal Civil Service | <input type="checkbox"/> Chemical Courses | <input type="checkbox"/> Mechanical Courses | <input type="checkbox"/> Locomotive Engineer |
| <input type="checkbox"/> Retail Business Management | <input type="checkbox"/> Chemical Engineering | <input type="checkbox"/> Forging | <input type="checkbox"/> Locomotive Machinist |
| <input type="checkbox"/> Retail Management | <input type="checkbox"/> Chemistry, Analytical | <input type="checkbox"/> Foundry Work | <input type="checkbox"/> Railroad Section Foreman |
| <input type="checkbox"/> Sales Management | <input type="checkbox"/> Chemistry, Industrial | <input type="checkbox"/> Heat Treatment of Metals | <input type="checkbox"/> Stationary Engineering Courses |
| <input type="checkbox"/> Salesmanship | <input type="checkbox"/> Food-Plant Sanitation | <input type="checkbox"/> Industrial Engineering | <input type="checkbox"/> Power Plant Engineering |
| <input type="checkbox"/> Stenography | <input type="checkbox"/> Petroleum Production & Refining | <input type="checkbox"/> Industrial Instrumentation | <input type="checkbox"/> Stationary Fireman |
| <input type="checkbox"/> Aeronautics Courses | <input type="checkbox"/> Plastics | <input type="checkbox"/> Industrial Metallurgy | <input type="checkbox"/> Stationary Steam Engineering |
| <input type="checkbox"/> Aeronautical Engineer's, Jr. | <input type="checkbox"/> Pulp and Paper Making | <input type="checkbox"/> Industrial Inspection | <input type="checkbox"/> Textile Courses |
| <input type="checkbox"/> Aircraft Drafting and Design | <input type="checkbox"/> Civil Engineering | <input type="checkbox"/> Machine Shop Inspection | <input type="checkbox"/> Cotton Manufacturing |
| <input type="checkbox"/> Aircraft Mechanic | <input type="checkbox"/> Highway Engineering | <input type="checkbox"/> Mechanical Drafting | <input type="checkbox"/> Designing, Finishing |
| <input type="checkbox"/> Engine Mechanic | <input type="checkbox"/> Reading Structural Blueprints | <input type="checkbox"/> Mechanical Engineering | <input type="checkbox"/> Loom Fixing |
| <input type="checkbox"/> Air Conditioning | <input type="checkbox"/> Sanitary Engineering | <input type="checkbox"/> Millwrighting | <input type="checkbox"/> Rayon Manufacturing |
| <input type="checkbox"/> Heating | <input type="checkbox"/> Structural Drafting | <input type="checkbox"/> Moto-Loft Work | <input type="checkbox"/> Textile Engineering |
| <input type="checkbox"/> Plumbing | <input type="checkbox"/> Structural Engineering | <input type="checkbox"/> Patternmaking—Wood, Metal | <input type="checkbox"/> Woolen Manufacturing |
| | <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> Reading Shop Blueprints | |
| | | <input type="checkbox"/> Sheet-Metal Drafting | |
| | | <input type="checkbox"/> Sheet-Metal Worker | |

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

Representatives in all principal cities. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Men, can your hair pass the caress test?



**Grooms hair,
never
greases it**



The proof is in
the palm of your hand!

20% more
for your money!

Using a hair tonic now? Then try this simple test. Rub your hand across your hair—just as she might do tonight! Does your palm pick up a sticky film of oil or grease? If it does—switch to Mennen Cream Hair Tonic—it's lightly-blended—grooms the hair but leaves no trace! Contains Lanolin. Helps remove dandruff scales and relieves dry scalp. Get your first bottle today—pass the caress test tonight!

MENNEN

Cream Hair Oil **FOR MEN**

(Continued from page 8)

a uniform thickness of air is assured. Air is forced through capillaries drilled to only .003-inch diameter—too small for the human eye to examine. When assembled, frictionless suspensions are possible. The starting friction of such a bearing is zero, and the weight of a feather will spin a heavy shaft supported by air bearings. It has been calculated that two mice could easily pull a fully loaded 100-car freight train equipped with air bearings.

It has been further calculated that if a watch were designed with air bearings, it would run for many, many human lifespans. Until something better comes along, this type of bearing is undoubtedly the nearest thing to perpetual motion that yet has been developed.

Victor Black,
Aerophysics Laboratory,
North American Aviation, Inc.,
Downey, Calif.



Rubberneck Bus

A British circus has found a new use for obsolete double-decker busses. They provide perfect personnel carriers for giraffes. A representative of the Chipperfield Circus found the bus of ancient vintage (circa 1933) awaiting the junkmen, and bought and remodeled it for Sambo, an 18-month-old giraffe, by removing the top-deck structure. When Sambo grows to his full height, a hole will be cut in the roof—and traffic will get the surprise of its life. J. L. Taylor of St. Annes, Lancashire, who reported this bit to us, comments, "Incidentally, this bus has carried hundreds of American Air Force personnel from Warton Air Base."

AUDELS TV-RADIO SERVICE LIBRARY

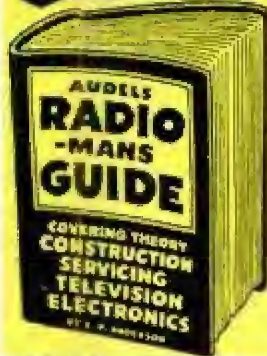
2 VOLS. \$6 COMPLETE \$1 A MO. PAY ONLY 1 MO.

HERE IS LATE INFORMATION IN A HANDY FORM FOR RADIO & TELEVISION REPAIRMEN, SERVICEMEN AND STUDENTS
IT PAYS TO KNOW!

AUDELS T.V.-RADIO SERVICE LIBRARY presents the important subjects of Modern Radio, Television, Industrial Electronics, F.M. Public Address Systems, Auto, Marine & Aircraft Radio, Phonograph Pick-Ups, etc. Covers Basic Principles—Construction—Installation—Operation—Repairs—Trouble Shooting. Shows how to get Sharp, Clear T.V. Pictures. Install Aerials—How to Test. Explains Color Systems & Methods of Conversion. 1001 Facts—Over 1260 Pages—625 Illustrations of Parts & Diagrams—Valuable for Quick Ready Reference & Home Study. Tells How to Solve T.V. & Radio Troubles—Answers T.V. & Radio Questions.

Get this information for Yourself, 7 DAY TEST—ASK TO SEE IT!

MAIL ORDER



AUDELS, Publishers, 49 W. 23rd St., New York 10, N.Y.
Mail AUDELS T.V. RADIO SERVICE LIBRARY 2 Vols. \$6 on 7 days free trial. If O.K. I will remit \$1 in 7 days and \$1 monthly until \$6 is paid. Otherwise I will return them.

Name _____
Address _____
Occupation _____
Employed by _____ 30

AUDELS Carpenters and Builders Guides 4 vols. \$6



Inside Trade Information for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—including new methods, ideas, solutions, plans, systems and money saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, simply fill in and mail FREE COUPON below.

Inside Trade Information On:
How to use the steel square—How to file and set saws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint.



AUDELS, Publishers, 49 W. 23rd St., New York 10, N.Y.
Mail Audels Carpenters and Builders Guides, 4 vols., on 7 days' free trial. If O.K. I will remit \$1 in 7 days and \$1 monthly until \$6 is paid. Otherwise I will return them. No obligation unless I am satisfied.

Name _____
Address _____
Occupation _____
Employed by _____ 36

WHAT ALL AUTO MECHANICS WANT TO KNOW

1800 PAGES



This Big Practical Book gives full information with working diagrams covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.

Diesel Engines, Hydramatic & Fluid Drives Fully Explained.

A complete Guide of 1800 pages, with over 1500 illustrations showing inside views of working parts, with instructions for service jobs.

IT PAYS TO KNOW

How to fit pistons—How to locate engine knocks. How to fit connecting rod bearings—How to service main bearings—How to recondition valves—How to time valves—How to adjust fan belts—How to adjust carburetors and chokes. How to rebuild a clutch—How to service automatic transmissions—How to service brakes—How to adjust steering gear—How to cope with ignition troubles—How to service distributors—How to time ignition—How to "tune up" an engine.



\$4 COMPLETE • PAY \$1 A MO. TO GET THIS ASSISTANCE FOR YOURSELF SIMPLY FILL IN AND MAIL COUPON TODAY.

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a Handy Form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION. Send No Money. Nothing to pay postman.

MAIL ORDER

AUDELS, Publishers, 49 W. 23 St., NEW YORK 10, N.Y.

Please send me postpaid for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail \$1 in 7 days on each book or set ordered and further mail \$1 monthly on each book or set until I have paid price, otherwise I will return them.

- AUTOMOBILE MECHANICS GUIDE, 1800 Pages \$ 4
- TRUCK & TRACTOR GUIDE, 1299 Pages 4
- DIESEL ENGINE MANUAL, 575 Pages 2
- MACHINISTS HANDY BOOK, 1650 Pages 4
- WELDERS GUIDE, 400 Pages 1
- BLUE PRINT READING, 416 Pages 2
- MATHEMATICS & CALCULATIONS, 700 Pages 2
- SHEET METAL PATTERN LAYOUTS, 1100 Pages 4
- SHEET METAL WORKERS HANDY BOOK, 388 Pgs. 1
- MECHANICAL DRAWING GUIDE, 160 Pages 1
- MECHANICAL DRAWING & DESIGN, 480 Pages 2
- AIRCRAFT WORKER, 240 Pages 1
- TELEVISION SERVICE MANUAL, 384 Pages 2
- RADIOMANS GUIDE, 914 Pages 4
- ELECTRONIC DEVICES, 216 Pages 2
- ELECTRIC MOTOR GUIDE, 1000 Pages 4
- ELECTRIC WIRING DIAGRAMS, 272 Pages 1
- ELECTRICIANS EXAMINATIONS, 250 Pages 1
- ELECTRIC POWER CALCULATIONS, 425 Pages 2
- HANDY BOOK OF ELECTRICITY, 1440 Pages 4
- ELECTRIC DICTIONARY, 9000 Terms 2
- ELECTRIC LIBRARY, 7000 Pages (12 Book Set) 18
- MARINE ENGINEERS HANDY BOOK, 1258 Pgs. 4
- SHIPFITTERS HANDY BOOK, 250 Pages 1
- REFRIGERATION & Air Conditioning, 1280 Pgs. 4
- MILLWRIGHTS & MECHANICS GUIDE, 1200 Pgs. 4
- POWER PLANT ENGINEERS GUIDE, 1500 Pages 4
- ENGINEERS & FIREMANS EXAMS, 525 Pages 1
- PUMPS, Hydraulics & Air Compressors, 1658 Pgs. 4
- ENGINEERS LIBRARY (3 Book Set) 9
- MECHANICAL DICTIONARY, 950 Pages 4
- GARDENERS & GROWERS GUIDES (4 Book Set) 6
- CARPENTERS & BUILDERS GUIDES (4 Book Set) 6
- PLUMBERS & Steamfitters Guides (4 Book Set) 6
- MASONS AND BUILDERS GUIDES (4 Book Set) 6
- PAINTERS & DECORATORS MANUAL, 450 Pgs. 2
- HOUSE HEATING GUIDE, 1000 Pages 4
- OIL BURNER GUIDE, 384 Pages 1

Check NOW!

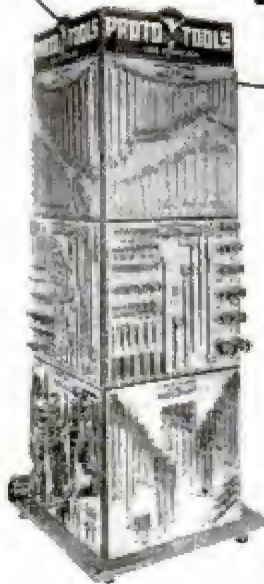
You Can Look Over Any Guide In Your Own Home — Start the Easy Payments If Satisfied

MAIL THIS TODAY

Name _____
Address _____
Occupation _____
Employed by _____ 36



**Sir Launcelot Wins
All His Duels
... 'cause
PROTO means
PROfessional
TOols!**



One reason why PROTO tools are professional tools is that they are made from PROTO-specified alloy steels. Known as PROTO-LOY, these special alloy steels provide great strength, hardness, toughness — and extra long life. Scientific heat treatment, advanced designs, accurate manufacture, a meaningful guarantee and completeness of line are more reasons why experts prefer PROTO. For truly professional tools, see your PROTO dealer. Send 10¢ for 68-page catalog to

PLUMB TOOL COMPANY
2255R Santa Fe Ave.,
Los Angeles 54, Calif.

5283

The PROTO Line
Includes Wrenches,
Pliers, Screwdrivers,
Punches, Chisels,
Sockets & Handles
and Many Others.



Eastern Factory—Jamestown, N.Y.

WHERE-TO-BUY-IT INDEX

Source of supply appears after items commercially available

ATOMIC RESEARCH

Radioactive sugar	16
Atomic-pile heat warms building.....	78
Atom-powered sub "Print a minute" camera acts as atomic-radiation detector (Polaroid Corporation, Cambridge 39, Mass.).....	80 131

AUTOMOTIVE

Derrick-wrecker transfers cargo.....	70
Detroit listening post.....	88
Gasoline-flow regulator gives better auto mileage (Schneider Carburetor Co., 620 Chestnut St., St. Louis 1, Mo.).....	89
Pigeonhole garage	114
Two-story British trailer.....	132
Retired sailor builds cars for handicapped veterans.....	133

AVIATION

Electric lifting arm clamps to side of plane.....	70
British superjets to power warplanes.....	71
German model-plane builders follow sweptback-wing trend... ..	77
Pulse jets power glider.....	80
Breakable Hans helps Air Force.....	80
Jet-fuel truck	89
Close-up photos from miles away.....	96
Heaviest carrier plane.....	113
Lifeboat has invisible crew.....	110
Belgian helicopter mail service.....	133

FARM AND GARDEN

Gopher exterminator	76
Vacuum cleaner for animals (Wayne Limberg, Plymouth, Wis.).....	141
Chemical turns clods into garden soil.....	147
Sawdust useful as mulch, but nitrogen must be added.....	234

HOBBIES AND NOVELTIES

"Silent" organ has 24 keyboards.....	77
Mystery top (Britain Products Co., 380 E. Exchange St., Akron 4, Ohio).....	98
"Torpedo" lure steers itself (Challenge Tackle, Inc., 228 Arch St., Meadville, Pa.).....	103
Portable pit for pole vaulting.....	112
Floor for a pond.....	113
Projector has splicer built into base.....	123
R.F.D.	134
Seesaw merry-go-round	147

HOUSE AND HOME

Circle-cutter for ceramic tile simplifies tiling around fixtures (McLin and Grody, Inc., 4332 San Fernando Road, Glendale 4, Calif.).....	70
Furniture calculator suspends person in mid-air to determine contours	71
Turntable eases garaging.....	80
"Steam bath" for face (Albin Sprenger, Mühlenstrasse, St., Andrea:berg/Harz, Germany, British Zone).....	95
Plastic disk with adhesive on both sides take place of thumb- tack (Thompson-Winchester Co., 301 State St., Boston 9, Mass.).....	123
Moisture indicator (Walter Drake, Drake Building, Colorado Springs, Colo.).....	124
Plastic trellis (Britain Products Co., 380 E. Exchange St., Akron 4, Ohio).....	124
Kiddie keeper (Kaydon Mfg. Co., P.O. Box 225, Santa Monica, Calif.).....	125
Ironing pad (Farber and Greenberg, 505 Fifth Ave., New York City 17).....	125
Pot hooks (Stclair Industries, St. Louis 10, Mo.).....	125
Fan-dehumidifier (O. A. Sutton Corp., Wichita, Kans.).....	125
Wire shelves (Straits Steel and Wire Co., Ludington, Mich.).....	125
Valance (Moe Light, Inc., Fort Atkinson, Wis.).....	125
Ceiling heater gives light, too (NuTone, Inc., Madison and Red Bank Road, Cincinnati, Ohio).....	148
Wedge-shaped furnace flues increase efficiency (Ingersoll Products Div., Borg-Warner Corp., Kalamazoo, Mich.).....	230
Vent tubes for walls (Morell Cap and Tube Vent, Inc., 1041 Carlyon Road, East Cleveland 12, Ohio).....	252

MILITARY

Transistors cut size of Army radios 10 times.....	95
Floating flame throwers.....	122
Army's "hextent"	148

MISCELLANEOUS

Synthetic gravel	76
Air becomes efficient weapon for fighting fires in oil tanks... ..	76
Electric wrist watch.....	95
"Circular" bridge permits continuous traffic flow.....	103
Nylon hypodermic syringe (MacGregor Instrument Co., Need- ham, Mass.).....	113
What! ... No concrete mixer?.....	116
Infrared light provides heat to copy typewritten pages (Min- nesota Mining and Manufacturing Co., 900 Fauquier Ave., St. Paul 6, Minn.).....	123
Sun has carbon monoxide.....	131

(Continued to page 14)

You Practice COMMUNICATIONS

I send you parts to build this transmitter

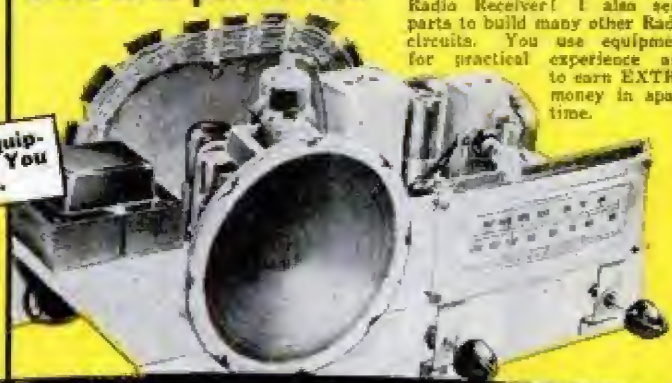


As part of my Communications Course you build this low power broadcasting transmitter, learn how to put a station "on the air," perform procedures demanded of Broadcast Station operators, make many tests.

This is just part of the equipment my students build. You keep all parts I send.

You Practice Radio SERVICING

on this modern radio you build with parts I send



As part of my Servicing Course, I send you the speaker, tubes, chassis, transformer, loop antenna, EVERYTHING you need to build this modern, powerful Radio Receiver! I also send parts to build many other Radio circuits. You use equipment for practical experience and to earn EXTRA money in spare time.

BE A RADIO-TELEVISION TECHNICIAN

NOW! Advanced Television Practice

New, special TV kits furnished to build high-definition SCOPE . . . RF OSCILLATOR with flyback power supply . . . complete TV set . . . many other units. You see pulse, trapezoidal, saw-tooth wave forms. Get valuable PRACTICAL EXPERIENCE locating and correcting TV troubles. Mail coupon for facts, pictures and prices!

Learn Servicing or Communications Practice at Home in Spare Time



Do you want good pay, a job with a bright future and security? Would you like to have a profitable shop or store of your own? If so, find out how you can realize your ambition in the fast growing, prosperous RADIO-TELEVISION industry. Even without Television, the industry is bigger than ever before. 90 million home and auto Radios, 3100 Broadcasting Stations, expanding use of Aviation and Police Radio, Micro-wave Relay, Two-way Radio for buses, taxis, etc., are making opportunities for Servicing and Communications Technicians and FCC-Licensed Operators.

Television is TODAY'S Good Job Maker

J. E. SMITH, President National Radio Institute
In 1950, over 5,000,000 TV sets sold. By 1954, 25,000,000 TV sets estimated. Over 100 TV Stations now operating. Authorities predict 1,000 TV Stations. This means more jobs, good pay for qualified men all over the United States and Canada.

Many Make \$10 Extra a Week in Spare Time

Keep your job while training. Hundreds of successful RADIO-TELEVISION TECHNICIANS I trained had no previous experience, some only a grammar school education. Learn Radio-Television principles from illustrated lessons. Get PRACTICAL EXPERIENCE—build valuable multimeter—experiment with circuits common in Radio and Television. Keep all equipment. Many students make \$5, \$10 extra a week fixing neighbors' Radios in spare time. SPECIAL BOOKLETS start teaching you the day you enroll.

Send Now For 2 Books FREE—Mail Coupon

Send now for my FREE DOUBLE OFFER. You get actual Servicing lesson to show you how you learn at home. Also my 64-page book, "How to Be a Success in Radio-Television." Read what my graduates are doing, earning; see equipment you practice with at home. Send coupon in envelope or paste on postal. J. E. SMITH, President, Dept. 2EA, National Radio Institute, Washington 9, D. C. Our 39th Year.

Good for Both—FREE

MR. J. E. SMITH, President, Dept. 2EA National Radio Institute, Washington 9, D. C.

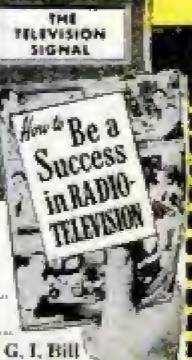
Mail me Sample Lesson and 64-page Book about How to Win Success in Radio-Television. Both FREE. (No Salesman will call. Please write plainly.)

Name.....Age.....

Address.....

City.....Zone.....State.....

Approved for training under G. I. Bill



I TRAINED THESE MEN

"I have been operating my own Servicing business. In two years I did \$14,000 worth of business; net profit \$6,350. Have one full time employee, an NRI student.—PHILLIP G. BROGAN, Louisville, Ky.

"Four years ago, I was a bookkeeper, with a hand-to-mouth salary. Now I am a Radio Engineer with a key station of the American Broadcasting Company network.—NORMAN H. WARB, Ridgely Park, New Jersey.

"When halfway through the NRI course, I made \$5 to \$8 a week fixing sets in my spare time. Am now selling and installing Television sets and antennas.—E. J. STREIT-ENBERGER, New Boston, O.

"My first job was operator with KDLR, obtained for me by your Graduate Service Dept. I am now Chief Engineer of Police Radio Station WQOX. I never hesitate to endorse NRI.—T. S. NORTON, Hamilton, Ohio.

Sample Lesson

FREE



"THE TELEVISION SIGNAL"

Coupon brings you actual Television lesson. It makes clear fundamentals of TV receiver operation. You'll understand how the cathode tube works as an image reproducer, how brightness and contrast controls operate. You'll read about the image scanner, interlaced scanning, etc. Mail coupon now.

Have Your Own Business

Many N.R.I. trained men start their own Radio-Television sales and service business without capital. Let me show you how you, too, can be your own boss, have a good income from your own shop. Send coupon for FREE book now!

Tested Way to Better Pay

VOTE TODAY FOR THE FUTURE YOU WANT!

AMERICAN SCHOOL,
Dept. G545, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

- | | | |
|--|---|---|
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Drafting—Building Trades | <input type="checkbox"/> Plastic Engineering |
| <input type="checkbox"/> Air Conditioning | <input type="checkbox"/> Drafting—Machine Trades | <input type="checkbox"/> Plumbing—Practical |
| <input type="checkbox"/> Architecture & Building | <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Private Secretary |
| <input type="checkbox"/> Automotive Technician | <input type="checkbox"/> Electricity—Practical | <input type="checkbox"/> Refrigeration |
| <input type="checkbox"/> Better Foremanship | <input type="checkbox"/> Electronics—Industrial | <input type="checkbox"/> Retail Merchandising |
| <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> High School Courses | <input type="checkbox"/> Salesmanship—Outside |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Machine Shop Operations | <input type="checkbox"/> Sheet Metal Work |
| <input type="checkbox"/> Commercials | <input type="checkbox"/> Mathematics & Slide Rule | <input type="checkbox"/> Tool Making |
| <input type="checkbox"/> Diesel Technician | <input type="checkbox"/> Mechanical Engineering | |

Name..... Occupation.....
Home Address..... Age.....
City..... State.....

THIS IS YOUR BALLOT
Find the subject that interests you most and then... Check, Sign and Mail Today

• Today, choose the job you want — and prepare for it in spare time at home. Or if you are already engaged in the work you like best, start training now for quicker promotion. In hours you might otherwise waste, gain the knowledge and skill that can help you to get ahead faster, make more money, and have greater security.

Training Backed by 55 Years of Experience

For over half a century American School has helped ambitious men and women toward success by providing specialized training for commercial and technical advancement. Its study program for you has been planned by experts with years of experience in the subject you select and they will give you needed guidance every step of the way.

Don't Delay Your Start

Give serious thought to the list of training courses listed above. Pick the opportunity that interests you, check it and add your name and address. (Check more than one if you are undecided as to which appeals most.) Finally clip out and mail the "ballot" and full information will be supplied, without cost or obligation.

AMERICAN SCHOOL
DEPT. G545, DREXEL AT 58th, CHICAGO 37, ILL.

THE SOONER YOU START, THE SOONER YOUR GOAL CAN BE REACHED

(Continued from page 12)

Blueprints slipped from filing cabinet without removing others (Berwin Trading Co., 15 Park Row, New York City 7).....	141
Synthetic remedy for malaria.....	141
Portable rim-circle saw (Barker Saw Co., Box 925, Commercial Station, Springfield, Mo.).....	141
Munich rail-station sign flashes hotel vacancies.....	147
Snowshed protects highway from drifts and rocks.....	148
Paper made of glass.....	228
Automatic weather stations.....	230
Acid-immune metals.....	236
Planet bumped moon long ago.....	242
Chemical kills algae in lakes.....	258

Craftsman and Shop Notes Index

AUTOMOTIVE

Bumper jacks placed under trailer provide support while parked.....	157
Defrosters dry dirty car windshield to facilitate easy cleaning.....	161
Removing gasoline-gauge float from car fuel tank.....	170
Caution lights operate on car when horn is sounded.....	170

FARM

Telescoping drive shaft saves time when tractor powers elevator.....	208
Pitchfork tines kept clean in bag of dry sand.....	208
Sleeves on planter hoppers increase seed capacity.....	208
Old auto shock absorber cushions tractor seat.....	210

GARDENING

Handy lawn-mower "holster" carries grass clippers.....	160
Riding trailer for power lawn mower.....	171
Portable worktable for the gardener.....	175
Laying flagstones.....	176
Stovepipe cuts strawberry runners.....	185
Attractive garden ornament constructed from scrap materials.....	185
Old window or door screen used as flower trellis.....	190

HOUSE AND HOME

Lubricating an electric clock.....	157
Miniature clothes rack constructed from dowels teaches small children orderliness.....	157
Inexpensive serving trays from cookie sheets.....	160
Mousetrap fitted with handle prevents accidental springing.....	160
Solving home problems.....	162
Miniature hothouse is heated by air from basement.....	164
Wire cradles support bottles under refrigerator shelves.....	164
Loaf-sugar dispenser.....	165
Trellises constructed inside steel frames provide permanent clothesline supports.....	178
Stapling plastic screen.....	178
Novel sewing kit adapted from paddle-ball toy displays spools of thread for easy use.....	179
Outdoor fireplace has tables and benches built into single unit for convenience.....	184
Box for storing little-used items pivoted between floor joists.....	184
Automobile frame provides sturdy clothesline supports.....	185
Filter for cistern pump.....	189
Wrench kept near shutoff valve for emergency use.....	190
Guards on corners of casement windows prevent head injuries.....	210

METALWORKING

Protecting heads of rivets while peening them.....	167
Attaching object to thin metal when one side is accessible.....	169
Valve push rod flares tubing.....	166
How to cut large metal sheets with a hacksaw.....	170

OFFICE, SHOP AND STORE

Typewriter ribbon taped to paper used in tracing border designs.....	157
Way to "sharpen" grease pencils.....	166
Nail-polish brush can be used for lettering and line work.....	166
Bottle-cap mailing container.....	170
Small-parts containers for shop made from coconut shells.....	173
Cork disk under compass point protects unused drawing paper.....	173
Cutting tape into narrow strips.....	190
Holder for typist's notebook.....	199
Handy welding-rod rack.....	199
Quick-acting stopper for a jar.....	199

PAINT AND PAINTING

"Splints" for misshapen brushes.....	164
Paper plate catches paint drippings.....	164
Long-lasting crack filler has cornstarch base.....	167
Painting hints.....	167
Tubing shields water-color brush.....	185

PHOTOGRAPHY

Negatives dried quickly in solution of alcohol and water.....	193
Tape holds paper flat on easel when making borderless prints.....	194
Negatives protected in developer by use of alternate slots.....	194

(Continued to page 16)

IMPORTANT NOTICE—It is the intention of this magazine to provide its readers with information regarding the latest developments in the mechanical arts. We take no responsibility as to whether the disclosures contained in our articles are covered by patents and advise readers to investigate this subject before making, using, or selling any of the products, machines, or processes described in order to avoid possible liability for patent infringements.

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

21 - E DISTRICT NATIONAL BUILDING

WASHINGTON 5, D. C.

AUTOMOTIVE MAINTENANCE AND Trouble Shooting

- For
- ✓ SHOP INSTRUCTION
- ✓ GARAGE
- ✓ SERVICE STATION OPERATOR
- ✓ FLEET OWNER
- ✓ HANDYMAN

10 Day Free Trial Examination

Partial list of contents:

Engine Tune-Up; Generator Output Low; Starting Motor Spins; Cranks, but does not start; Misfires at High Speed; Fuel Mixture Too Lean; Spark at Some but not all Spark Plug Wires; Test Coil Output; How the Magneto Works; Engine Overheats; Diagnosis of Steering Control; Wheel Alignment; Low Pedal Reserve, etc.

Shows you:

- How to forestall trouble
- How to locate sources of trouble
- How to restore vehicle to satisfactory operation
- How to do a complete tune-up job

A brand new, complete, step-by-step manual—unsurpassed in its field—that shows you HOW and tells you WHY!

This big abundantly-illustrated volume is as much for the expert who needs an up-to-date shop reference at hand, as it is for the beginner who is looking for the perfect guide and tool.

No previous work in the field of automotive mechanics can compare to **AUTOMOTIVE MAINTENANCE AND TROUBLE SHOOTING**. For in its over 400 pages you will find trouble shooting procedure, tests and adjustments arranged in an unusually simple and easy to follow order—one that quickly directs you to the specific solution.

An important part of this useful volume is the jacket itself which unfolds into a valuable 17 x 20 tune-up wall chart. By following this chart and the step-by-step tune-up procedures described in the book, you can quickly isolate the seat of the trouble.

You will marvel at the way this book helps you understand WHY certain things are done through its down-to-earth explanation and clear-cut illustrations. And it won't be long before you will find yourself developing the ability and know-how to apply similar logic to any unusual situation!

Over 400 Pages Over 200 Illustrations **\$4.75**

THIS COUPON IS GOOD FOR 10 DAYS TRIAL!

American Technical Society (Publishers Since 1898)
Dept. AM-19, 848 East 58th St., Chicago 37, Illinois

Please ship me at once **AUTOMOTIVE MAINTENANCE AND TROUBLE SHOOTING** for free 10 day examination. If I keep the book, I will pay \$4.75 plus a few cents postage, otherwise I will return books and owe nothing.

- | | | | |
|------------|--------------------------|---|--------|
| Examines | <input type="checkbox"/> | Automotive Maintenance and Trouble Shooting | \$4.75 |
| Free | <input type="checkbox"/> | Automotive Fundamentals | 4.90 |
| at Home | <input type="checkbox"/> | Automotive Engines, Maintenance and Repair | 4.50 |
| No | <input type="checkbox"/> | Automotive Suspensions, Steering, and Wheel Alignment | 4.50 |
| Obligation | <input type="checkbox"/> | Machine Shop Work | 3.75 |
| | <input type="checkbox"/> | Practical Mathematics | 2.75 |

Print Name _____

Street or RFD _____

City _____ Zone _____ State _____

To save postage, I am enclosing payment.

PLASTICS

- Thermoplastic toys mended quickly using soldering iron.....178
- Repairing plastic toys.....184
- Working plastics on bench lathe aided by oiling cutting tools..199

TOOLS

- Glass cutter provided with case made from shotgun shell....166
- Pruning saw carried safely.....172
- Small hand grinder guided easily.....173
- Faceplate lathe from polishing head.....174
- Lathe used for mixing paint.....178
- Battery-cable puller saves posts.....178
- Painter's brush guide (Thoss Mfg. Co., 306 S. Third, North Manchester, Ind.).....184E
- Portable welder (Generator Sales Co., 1627 N. Damen, Chicago).....184E
- Self-setting clamp (Alpha Tool and Supply Co., Box 119, Westwood, N. J.).....184E
- Electrode-tip dresser (S-M-S Corp., 1165 Harper Ave., Detroit 11, Mich.).....184E
- Four-in-one bench tool (Albert Tatu, 85 Columbia Drive, Williamsville, N. Y.).....184E
- High-temperature paint peelers (Otto Konigslow Mfg. Co., 2129 W. Second, Cleveland 13, Ohio).....184F
- Convertible masonry saw (Clipper Mfg. Co., 2800 Warwick, Kansas City, Mo.).....184F
- Carpenter's bar clamps (Bass and Co., 50 Broad St., New York City).....184F
- Snap-in, snap-out glass containers (American Coating Service, 222 E. 50th St., Chicago).....184F
- Square serves as marking gauge.....189
- Cap made from plywood disks protects drill pad.....199
- Removing pipe from fittings without damaging threads.....202
- Floor stand for portable grinder made from cream-separator base.....208
- Precision modelmaker's bench vise.....209
- Portable acetylene welding rig carries motor-powered grinder.210
- Plugs for stored lathe chucks protect spindle threads.....210

WOODWORKING

- Wren house features pull-out floor.....161
- Plan of the month—folding porch chairs.....168
- Carpenter's square scribes lumber.....173
- Fastening with wood screws.....184A
- Suitcase sawhorse.....202

MISCELLANEOUS

- Reflecting camp oven.....158
- Burs in dog's hair removed easily when softened with light oil.161
- Paraffin rustproofs zippers.....164
- Caster cup used as coin tray at refreshment booth.....186
- Improvised money belt.....170
- Lantern anchored safely in bucket of sand.....173
- Rubber glove regains shape from inside air pressure.....178
- Tweezers with sharpened points help remove splinters in hand.178
- Supply of matches doubled by splitting each one.....184
- Hole made in flat spring with nail set.....189
- Superhives anchored on steel rods are easily removed and replaced.....190
- Loops tied in long rope provide sure grip.....190
- Indicator shows status of 10 valves serving ranch water system.....202
- Dry ice in leaky gas tank removes vapors before welding.....202
- Water cleans gummy shears.....208
- Locating underground pipe leak.....210

Radio-Television, Electronics

- Marine radio and electronic equipment (Radiomarine Corporation of America, 75 Varick St., New York City).....211
- Pocket-size six-tube hearing aid (Sonotone Corporation, Elmstord, N. Y.).....216
- Microphone of advanced design (University of California at Los Angeles, Los Angeles, Calif.).....216

Radioactive Sugar

Tagged with an atom of radioactive carbon 14, "hot" sugar will give scientists new knowledge of chemical processes in living organisms ranging from man to bacteria. Because it is radioactive, the sugar can be traced as it travels in the body. From a study of its path and reactions, scientists hope to learn much that may prove useful in the fight against disease, including cancer and tooth decay. The cost of radioactive sugar makes today's grocery-store prices look puny—it sells for \$28,000 an ounce!

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • COPYRIGHTS • PATENTS

1357 VICTOR BUILDING, WASHINGTON 1, D. C.

"Can I save enough on gas to pay for my oil?"

Yes, if it is Macmillan Ring-Free Motor Oil.

Question: "But how is that possible?"

Answer: Because Macmillan Oil makes your car go faster or farther or climb a steeper hill on the same amount of gasoline.

Q: "I still don't get it. Why?"

A: Follow this closely, please. Automotive engineers tell us that 50% of your gasoline is burned up overcoming engine friction (at 40 miles an hour on a level highway).

Q: "What's that got to do with it?"

A: Anything that reduces this friction means that less of your tankful is needed to overcome friction and more of it can drive your car.

Q: "So?"

A: Tests show that motorists get an average of 8% more power from the same amount of gasoline after they change from whatever brand they have been using to Macmillan Ring-Free Motor Oil.

Q: "What tests?"

A: Hundreds and hundreds of cars like yours were tested on a Dynamometer—the testing machine accepted by the automotive industry to measure power.

Q: "Well, what's so wonderful about 8%?"

A: At 25¢ a gallon, 8% means 2¢ saved on every gallon. And over a normal period between oil drains, that means \$2.00—enough to pay for your Macmillan Oil refill.

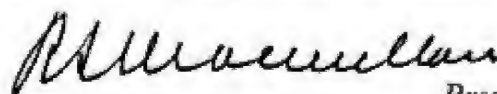
Q: "I see. Macmillan Oil gives me enough extra miles from a tankful of gas to save me the cost of a Macmillan refill. Is that it?"

A: Exactly. If you are getting average mileage, with Macmillan you get an *extra 20 miles* from every tankful. But that isn't all.

Q: "What else?"

A: While it's reducing friction, Macmillan Oil does a cleaning job by reducing deposits of carbon and gum in the combustion chamber, in rings, valves and valve stems. Macmillan contains a natural cleansing element inherent in the oil itself. And a cleaner motor means higher compression from better piston seal, sweeter running and less chance of ping. Your motor stays new longer, uses less oil—because less friction means less repairs, fewer bills.

The big red "M" tells you where to drive in to find Macmillan Oil—at independent service stations, garages and car dealers.



President

MACMILLAN PETROLEUM CORPORATION
530 W. 6TH STREET, LOS ANGELES
50 W. 50TH, NEW YORK • 624 S. MICHIGAN, CHICAGO

SPECIAL NOTICE

P.S. There's an easy way to find out which dealers near you can service your car with Macmillan Ring-Free Oil. Just pick up your 'phone and call Western Union (by number). Then ask for Operator 25. Give her your name, address, and telephone number. Your inquiry will receive my prompt attention. Don't put it off. Start taking better care of your motor right now. R.S.M.

NOW!



Industry needs *trained* men—needs them NOW!

Can you qualify for the premium jobs that are open to trained draftsmen, machinists, technicians?

You can, if you start preparing yourself immediately. And the International Correspondence Schools can help you.

Just mark and mail the coupon below. We'll rush you full information about practical, easy-to-understand I. C. S. Courses—courses being used by many defense industries to train their own workers.

The time for action is NOW!

INTERNATIONAL CORRESPONDENCE SCHOOLS



BOX 5527-L, Scranton 9, Penna.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Heating <input type="checkbox"/> Plumbing <input type="checkbox"/> Refrigeration, Domestic <input type="checkbox"/> Refrigeration & Air Conditioning <input type="checkbox"/> Steam Fitting <input type="checkbox"/> Aeronautics Courses <input type="checkbox"/> Aeronautical Engineer's, Jr. <input type="checkbox"/> Aircraft Drafting & Design <input type="checkbox"/> Aircraft Mechanic <input type="checkbox"/> Engine Mechanic <input type="checkbox"/> Architecture <input type="checkbox"/> Architectural Drafting <input type="checkbox"/> Building Estimating <input type="checkbox"/> Contractor's Building <input type="checkbox"/> House Planning <input type="checkbox"/> Art Courses <input type="checkbox"/> Commercial Art <input type="checkbox"/> Magazine Illustrating <input type="checkbox"/> Show Card and Sign Lettering <input type="checkbox"/> Automotive Courses <input type="checkbox"/> Automobile <input type="checkbox"/> Auto Electric Technician <input type="checkbox"/> Auto Body Rebuilding & Refinishing <input type="checkbox"/> Chemical Courses <input type="checkbox"/> Chemical Engineering | <ul style="list-style-type: none"> <input type="checkbox"/> Chemistry, Analytical <input type="checkbox"/> Chemistry, Industrial <input type="checkbox"/> Food-Plant Sanitation <input type="checkbox"/> Petroleum Production and Refining <input type="checkbox"/> Pulp and Paper Making <input type="checkbox"/> Civil Engineering <input type="checkbox"/> Bridge and Building Foreman <input type="checkbox"/> Highway Engineering <input type="checkbox"/> Reading Structural Blueprints <input type="checkbox"/> Sanitary Engineering <input type="checkbox"/> Structural Drafting <input type="checkbox"/> Structural Engineering <input type="checkbox"/> Surveying and Mapping <input type="checkbox"/> Communications Courses <input type="checkbox"/> Telegraphy <input type="checkbox"/> Electrical Courses <input type="checkbox"/> Electrical Drafting <input type="checkbox"/> Electrical Engineering <input type="checkbox"/> Electric Light and Power <input type="checkbox"/> Lighting Technician <input type="checkbox"/> Practical Electrician <input type="checkbox"/> Diesel Engines <input type="checkbox"/> Internal Combustion Engines <input type="checkbox"/> Mechanical Courses <input type="checkbox"/> Forging | <ul style="list-style-type: none"> <input type="checkbox"/> Heat Treatment of Metals <input type="checkbox"/> Industrial Engineering <input type="checkbox"/> Industrial Instrumentation <input type="checkbox"/> Industrial Metallurgy <input type="checkbox"/> Machine Shop Inspection <input type="checkbox"/> Mechanical Drafting <input type="checkbox"/> Mechanical Engineering <input type="checkbox"/> Millwrighting <input type="checkbox"/> Mold-Loft Work <input type="checkbox"/> Patternmaking—Wood, Metal <input type="checkbox"/> Reading Shop Blueprints <input type="checkbox"/> Sheet-Metal Drafting <input type="checkbox"/> Sheet-Metal Worker <input type="checkbox"/> Ship Drafting <input type="checkbox"/> Tool Designing <input type="checkbox"/> Welding—Gas and Electric <input type="checkbox"/> Radio Courses <input type="checkbox"/> Electronics <input type="checkbox"/> FM and Television Servicing <input type="checkbox"/> Radio, General <input type="checkbox"/> Radio Servicing <input type="checkbox"/> Railroad Courses <input type="checkbox"/> Car Inspector and Air Brake <input type="checkbox"/> Diesel Locomotive <input type="checkbox"/> Locomotive Engineer <input type="checkbox"/> Railroad Section Foreman | <ul style="list-style-type: none"> <input type="checkbox"/> Stationary Engineering <input type="checkbox"/> Power Plant Engineering <input type="checkbox"/> Stationary Fireman <input type="checkbox"/> Textile Courses <input type="checkbox"/> Cotton Manufacturing <input type="checkbox"/> Design Finishing <input type="checkbox"/> Rayon Mfg. <input type="checkbox"/> Woolen Manufacturing <input type="checkbox"/> Business Courses <input type="checkbox"/> Advertising <input type="checkbox"/> Business Administration <input type="checkbox"/> Business Correspondence <input type="checkbox"/> Business Law <input type="checkbox"/> Certified Public Accounting <input type="checkbox"/> Commercial <input type="checkbox"/> Federal Tax <input type="checkbox"/> High School and College <input type="checkbox"/> Industrial Supervis'n <input type="checkbox"/> Personnel—Labor Relations <input type="checkbox"/> Postal Civil Service <input type="checkbox"/> Retail Business Management <input type="checkbox"/> Salesmanship <input type="checkbox"/> Sales Management <input type="checkbox"/> Traffic Management |
|--|--|--|---|

Name _____ Age _____ Home Address _____
 City _____ State _____ Working Hours _____ A.M. to _____ P.M.
 Present Position _____ Employed by _____

Representatives in all principal cities. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Lend Me 15 Minutes A Day



..and I'll prove I can make you a **NEW MAN**



I'M trading in old bodies for new! I'm taking men who know that the condition of their arms, shoulders, chests and legs—their strength, "wind," and endurance — is not 100%. And I'm making **NEW MEN** of them!

If you can simply raise your arm and flex it, I can add **SOLID MUSCLE** to your biceps—yes, on each arm—in double-quick time! I can broaden your shoulders, strengthen your back, develop your whole muscular system **INSIDE** and **OUTSIDE!**

What Only 15 Minutes a Day Can Do

I can add inches to your chest, give you a vise-like grip, make those legs of yours lithe and powerful. I can shoot new strength into your old backbone, exercise those inner organs, help you cram your body so full of pep, vigor and red-blooded vitality that you won't feel there's even "standing room" left for weakness and that lazy feeling! Before I get through with you I'll have your whole frame "measured" to a nice, new, beautiful suit of muscle!

I Was a 97-lb. Weakling

All the world knows I was **ONCE** a skinny, scrawny 97-pound weakling. And **NOW** it knows that I won the title, "The World's Most Perfectly Developed Man." Against all comers! How did I do it? How do I work miracles in the bodies of other men in only 15 minutes a day? The answer is "Dynamic Tension," the amazing method I discovered and which changed me from a 97-pound weakling into the champion you see here!

FREE—My 32-Page Illustrated Book Is Yours — Not for \$1.00 or 10c — But FREE

Send **NOW** for my famous book, "Everlasting Health and Strength," 32 pages, packed from cover to cover with actual photographs and valuable advice. Shows what "Dynamic Tension," can do, answers vital questions. Page by page it shows what I can do for YOU.

This book is a real prize for any fellow who wants a better build. Yet I'll send you a copy absolutely **FREE**. Just glancing through it may mean the turning point in your whole life! So don't put it off—send the coupon to me personally: **Charles Atlas, Dept. 85, 115 East 23rd St., New York 10, N. Y.**

Charles Atlas

Actual photo of the man who holds the title, "The World's Most Perfectly Developed Man."



CHARLES ATLAS, Dept. 85, 115 East 23rd St., New York 10, N. Y.

Send me—absolutely **FREE**—a copy of your famous book, "Everlasting Health and Strength"—32 pages, crammed with actual photographs, answers to vital health questions, and valuable advice to every man who wants a better build. I understand this book is mine to keep, and sending for it does not obligate me in any way.

Name _____ Age _____
 (Please Print or Write Plainly)
 Address _____
 City _____ State _____

No Experience Needed To PRINT YOUR OWN POST CARDS

The **GEM STENCIL DUPLICATOR** saves money... gets results quickly! Hundreds of uses for every type of business and organization. We ship the **GEM** complete with all supplies, Guide Board for accurate printing and 60-page Book of Ideas at the special low price of only **\$8.50** (a \$15 value).

FREE TRIAL OFFER

Use the **GEM FREE** at our expense! **SEND NO MONEY.** Write and complete **GEM** outfit will be sent you postpaid. After ten days, send us only **\$8.50** or return the **GEM**. You must be satisfied!

BOND EQUIPMENT CO. Dept. 48
 6633 Enright • St. Louis 5, Mo.



Our 21st Year

LEARN WATCH REPAIRING



AT HOME. By our modern and original system of instruction you can learn every part of the **WATCH REPAIRING TRADE AT HOME.** Prepare yourself for a well-paying position or start in business after completing our course of instruction. Good watch repairers are in demand and generally earn very good salaries. For particulars apply to the **WISCONSIN SCHOOL OF WATCH REPAIRING**, 759 N. Milwaukee, Dept. 5, Milwaukee 2, Wis.

A "GOOD HAND" HELPS YOU SUCCEED!
LEARN TO WRITE WELL

Handwriting quickly improves with our easy-to-understand picture lessons! Put your spare time to good use; send today for **FREE BOOKLET**, "How to Become a Good Penman," or check volumes wanted below at \$1 each: Business Writing Artistic Writing Card Writing Bird & Design Flourishing Engrossing Alphabets. **COMPLETE SET \$4.50.** Ask for price list of penman's supplies.

Beautifully written, plus special pen-point for shaded writing. **OUR 53rd YEAR**
 Only 10¢

TAMBLYN SCHOOL OF PENMANSHIP
 S.A. Ziller, Pres., 442 Ridge Bldg., Kansas City, Mo., USA

LAW FREE BOOK



Your **FREE** copy of "The Law-Trained Man" shows how to gain prestige and greater earnings through Blackstone home law study. All instruction material furnished including 17-volume Law Library written by 65 well-known law authorities. Lawyers, Judges among our graduates. LL.B. degree. Low cost; easy terms. Write today.
BLACKSTONE COLLEGE OF LAW 225 N. Michigan Ave. Dept. 55, Chicago 1, Ill.
 A Correspondence Institution Founded in 1890

LEARN MEAT CUTTING At Home — In Spare Time



Get into the vital meat industry. Concise, practical Home Training based on 25 years proven instruction methods used at National's famous resident school. Prepares you for bigger pay as Meat Cutter, Supervisor, market manager or more money in your own store. Go as rapidly as your spare time permits. Diploma. Start **NOW** to turn your spare hours into money. Send for **FREE** bulletin today. No obligation.

NATIONAL SCHOOL OF MEAT CUTTING, INC., Div. U-140, Toledo 4, Ohio

BECOME AN EXPERT IN TRAFFIC

Traffic men earn \$4,000 to \$10,000 and up. Thousands of firms need experts on rates, tariffs, regulations. We train you thoroughly in spare time at home for executive traffic jobs. Personal training under traffic authorities. Placement counsel and help. Write for free 48-page book "Traffic Management—the Fast Growing Profession."

LASALLE Extension University, 417 So. Dearborn St.
 A Correspondence Institution Dept. 964T, Chicago 5, Ill.

THESE MEN ARE GETTING PRACTICAL TRAINING IN **ELECTRICITY**



On Real:

**A.C. and D.C. MOTORS
GENERATORS
SWITCHBOARDS
CONTROLLERS
WIRING JOBS
APPLIANCES
ELECTRONIC UNITS**

(Shown at left - Instructor explaining operation and testing of a large Motor Generator in our A.C. Department.)

AND **TELEVISION-RADIO**

On Real:

**TELEVISION SETS
RADIO RECEIVERS
F.M.
(Frequency Modulation)
RECORD CHANGERS
AUTO RADIOS
PUBLIC ADDRESS Systems**

(Right - Instructor helping students check the wiring and trace circuits of television receivers.)



Trained Men Needed for Defense and Military Programs

ELECTRICITY—RADIO—TELEVISION—ELECTRONICS—VITAL in defense program. Trained men whether 16 or up to 50 needed. **TRAIN QUICKLY** for better rating if drafted—Vital job in industry if not.

FINANCE PLAN for non-veterans. G. I. Approved. Special plan for men of draft age. **NOT "HOME-STUDY" COURSES!** At Coyne you learn on real, full-size equipment. Trained instructors show you how, then you do typical jobs yourself. We don't teach by mail.

CLIP COUPON NOW for big new illustrated Coyne book. Check whether interested in **ELECTRICITY** or **TELEVISION-RADIO** or both. No obligation; no salesman will call. Get vital facts now!

B. W. COOKE, President

COYNE [SCHOOL]

**A TECHNICAL TRADE INSTITUTE
CHARTERED NOT FOR PROFIT
Established 1899
500 S. Paulina Dept. 52-72H
Chicago 12, Illinois**

ELECTRICITY ★ TELEVISION ★ RADIO ★ REFRIGERATION ★ ELECTRONICS

**Mail Coupon for
BIG FREE BOOK!**



B. W. COOKE, President
COYNE SCHOOL
500 S. Paulina St., Chicago 12, Ill. 52-72H

Send **BIG FREE** book and details of your training offer. This does not obligate me and no salesman will call. I am interested in:

ELECTRICITY **TELEVISION-RADIO**

NAME

ADDRESS

CITY.....STATE.....

We teach you FREE!



We put you in Business!

HERE'S THE BIG OPPORTUNITY FOR YOU! Learn a new and fascinating occupation... a wonderful hobby... and MAKE MONEY AT THE SAME TIME! OPERATE AT HOME OR IN A SMALL SHOP! AND... the complete instructions... books, lessons and personal guidance COST YOU NOTHING! We teach you FREE how to make the most beautiful jewelry you have ever seen: door-knobs imbedded with interesting objects, nuts-lites, lock-keys, coasters, name-plates, ash trays, paper weights, statues, figurines, souvenirs, novelties, gadgets, etc... an endless variety of high-quality, highly saleable products out of LIQUID MARBLE, TRANSPARENT GEM-LIKE LIQUID PLASTIC, CERAMICS, PLASTER, COMPOSITIONS, STONE, ETC. All without tools or machinery! The manufacture of these lovely objects is as easy as pouring water out of a glass! And—you learn how ABSOLUTELY FREE! The only limitation is your own IMAGINATION! No special talents or experience are required!

You get more than the FREE INSTRUCTIONS! We also show you methods of selling your finished work... even selling part of it to us! Start on a shoestring! And over time, become established in one of the most fascinating and profitable occupations in existence!

Just send 25c for our big catalog, "CASTING MATERIALS, MOLDS, ETC." — and you're on your way! Along with the catalog we will include the book, "THE ART AND BUSINESS OF CASTING" absolutely FREE! And—surprising details on an amazing, exclusive Plasticast offer guaranteeing your success! DON'T DELAY! This could be the most important step of your lifetime! WRITE TODAY!

PLASTICAST CO. (DEPT. C)

P. O. Box 6737 (WRITE TO NEAREST ADDRESS) P. O. Box 987 Chicago, 80, Ill. Palo Alto, Calif.
CANADIAN CUSTOMERS: Send 35c for catalog to Canadian Ind. PLASTICS, 1056 1/2 W. Pender St., Vancouver, B. C.



New FALSE PLATE

for OLD IN 24 HOURS

Low As Only \$15.95



Wonderful New Scientific Method Transforms OLD, LOOSE, Cracked or Chipped Plates into LUSTROUS BEAUTY-PINK DUPONT PLASTIC PLATES

MONEY BACK GUARANTEE

Why envy beautiful false teeth of others? We will transform your old, loose, cracked or chipped plate into a beautiful new, lightweight DuPont Beauty-Pink Plastic Plate, using your own teeth. All missing and broken teeth matched and replaced. Your cost amazingly low; actually save many dollars. No impression needed under our new scientific False Plate Method, 24-Hour Service.

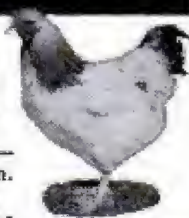
SEND NO MONEY Enjoy life again, and save money on beautiful, new, natural-looking plastic plate. Rush name and address now for full details sent FREE. If your plate is loose, we show you how to make it comfortable and tight-fitting before duplication. **West Dental Laboratory 127 N. Dearborn St., Dept. E-128, Chicago 2, Ill.**

HICKORY ACRES
6-WKS. OLD
STARTED

CAPONS

Easy, Profitable to Raise

Wonderful, tender capon meat brings top prices — makes finest eating. Easy to raise in back yard, on farm, or with other chicks. Hickory Acres 6-Wks. Old Capons are your best buy. Cost less than day old turkeys — easier to raise. Write for prices, information.



**HICKORY ACRES CAPON FARM
BOX PM, WINDSOR, MISSOURI**

LEARN CARTOONING Get in the BIG MONEY

Former Landon students are really cleaning up. Creators of "Steve Canyon", "Freckles", "Out Our Way", "Winnie Winkle", "Regular Fellers", "The Neighbors", "Strange as it Seems" are just a few of them. Simplified Landon Picture Chart method makes progress quick, exciting, easy. Earn while learning. Rush 10c for Picture Chart (to test your ability) and full details. Please state age.



Landon School of Cartooning, 5205 CTS Bldg., Cleveland, O.

WHY SUFFER TONGUE BITE?

Cost 3 times as much to build as the best of old-fashioned pipes. But KILL TONGUE BITE. STOP DRINK. FREE circular tells WHY. Write:



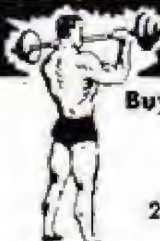
KLEENSMOK PIPES

P.O. No. M597,

Johnson City, Tenn.

R-Reg. U.S. Pat. Off. Pat's. and Pat's. Pend.

Bar Bells



Buy Direct From Factory **\$8.95** up

Write for free booklet and price list

INDEPENDENT IRON WORKS

2416 East 23rd Street, Dept. B
Los Angeles 58, Calif.

REAL ESTATE

BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! No obligation. Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in our classrooms in big cities. Diploma awarded. G.I. approved. Nationally known.

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
Suite 300 Law Bldg., Dept. PM, Kansas City, Mo.

FREE BOOK TELLS HOW

Learn PHOTOGRAPHY at Home

Prepare in spare time. Practical basic training. Long-established school. Send for free book. "Opportunities in Photography." No obligation.

AMERICAN SCHOOL OF PHOTOGRAPHY, 835 Diversy Parkway, Dept. L355, Chicago 14

GREER SHOP TRAINING

2230 So. Michigan Blvd.
Chicago 16, Illinois

Leader in Practical Training for 50 Years

Gain success by learning a trade offering security and high pay—go into business for yourself.

Get the "Know-how" at Greer

You learn in our new, large, modern shops by working with latest tools and equipment of the trade — tear down, inspect, repair and rebuild... under supervision of experts. Greer founded 1902. Over 51,000 successful grads. Part time, full time, day and evening. E-Z terms. Mail coupon today.

CLIP COUPON... MAIL TODAY
Greer Shop Training—2230 South Michigan
Chicago 16, Illinois Desk 213

Please send information about trade checked:
In our Chicago Shops: Auto Mechanics
 Body, fender Repair Diesel Mechanics
 Welding—Arc, gas Tool & Die
 Refrigeration & Air-conditioning
 Machine Shop Piano tuning
G.I. appr. for Vets. dischgd. after 7-25-47

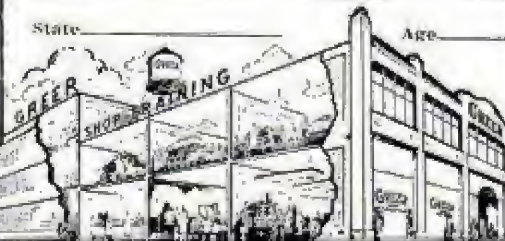
Or learn at home—extension courses:
 Diesel Refrigeration Plastics

Name _____

Address _____

City _____

State _____ Age _____



TRAIN AT HOME IN YOUR SPARE TIME

GET THE MONEY AND SECURITY YOU'VE ALWAYS WANTED!



L. J. ROSINKRANZ, President, National Schools, the man who has trained many, many men like YOU. Men who now own successful, respected businesses of their own. Men who hold important, high-paying positions in famous companies. You CAN be a success. Mail coupon for more details.

Let Me Show You How! Mail the Coupon for My FREE Books!

Each book has page after page in color. Gives you the complete story about my proved training method... tells how quickly it can train you for a secure, high-paying job. Don't wait. Get the facts. Send today for my valuable books on Radio-Television or Automotive-Diesel. Check the coupon at right and mail it to me today. Absolutely no obligation.

NO SALESMAN WILL CALL!

I'll send you a **FREE SAMPLE LESSON TOO**, if you act fast! Shows how easy it is to learn with National Schools Home Training.



DON'T PUT IT OFF...MAIL TODAY!

NATIONAL SCHOOLS, Dept. B-52
4000 South Figueroa Street
Los Angeles 37, California

Mail in envelope or paste on penny postal card

Send me *Free* the book checked below and the sample lesson. I understand no salesman will call on me.

- "MY FUTURE IN RADIO-TELEVISION & ELECTRONICS" OR
- "MY FUTURE IN DIESEL-AUTOMOTIVE & ALLIED MECHANICS."

NAME _____ AGE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Check here if you were released from the service less than 4 years ago.

Let National Schools - a resident-training school for nearly 50 years - train you at home for today's unlimited opportunities in Radio-TV or Automotive-Diesel. National Schools is one of the largest schools of its kind in the world. It has 4 big buildings of modern shops and labs. Its faculty is considered tops. You learn fast from easy lessons - all perfected under actual shop conditions. Approved for eligible vets.



Earn Extra Money while you're learning! I'll show you how!
EASY TERMS • FREE GRADUATE SERVICE
Mail coupon today - find out more!

WHICH HIGH-PAYING FIELD DO YOU WANT?

TODAY'S SHORTAGE OF TRAINED TECHNICIANS CREATES CHANCE OF A LIFETIME FOR YOU... IN EITHER FIELD!

RADIO-TELEVISION & ELECTRONICS

OR

AUTOMOTIVE-DIESEL AND ALLIED MECHANICS

JOB SECURITY! BIG MONEY! FOR YOU IN TODAY'S EXPANDING INDUSTRIES!

Think of it! With guided missiles, radar and other electronic devices so important to national defense. With big, new developments in color TV. With over 90,000,000 home and auto radios, over 12,000,000 TV sets. With more than 3100 radio stations... over 100 TV stations - and more building every day - imagine the terrific opportunity you have!

You Train at Home - In Your Spare Time

With National Schools Master Shop Home Training, you master all phases of Radio-Television-Electronics. You learn fast from hundreds of pictures and diagrams. All lessons have been developed and tested in National Schools famous shops and labs. No wonder your National Schools training is so up-to-date, practical, interesting. And so easy!

LOOK! WE SEND YOU ALL THESE PARTS! - and you keep them!



We send you lots of standard professional parts. You do lots of practical experiments. You learn step by step. Until you can build the big Superheterodyne Receiver you see above - and other important test units. Mail the coupon - today.

I TRAIN YOU FOR GOOD-PAYING JOBS LIKE THESE

Radio Station Engineer; District Service Manager; Aircraft Radio Inspector; Inspector Technician; Own your own repair shop; Service Specialist; Special Civil Service Positions; Sound Track Operator; Complete Television Service and many others.

Thousands of National Schools graduates have jobs like these. Why not you? Start your career - be sure to mail the coupon today.

Only National Schools Gives You This Professional Multi-Tester



You get this factory-made new Multi-Tester... an important instrument every Radio-TV man must have.

GREATEST DEMAND FOR TRAINED MEN IN HISTORY! NOW IS YOUR CHANCE!

What an opportunity! With over 8 million older cars needing big service and repair jobs. With defense industry having more high-paying jobs than they can fill. With the Armed Forces offering quick advancement to trained mechanics. YOU ARE NEEDED as never before! Now you can get the good pay, security, the satisfaction of doing what you want to do! Don't delay - mail the coupon NOW!

Right in Your Own Home!

You learn all about Gasoline Engines, Diesel and Special-Fuel Engines, Automotive Tune Up, General Garage Mechanics, Auto Electrical Service. You get complete training for this great, growing industry.

Yet National Schools Home Training is easy! Because it's based on actual shop methods in National Schools big resident school. Mail the coupon for more details - NOW.

National Schools Gives You All These Tools

You start out owning the tools of your trade. A kit of standard, professional tools and equipment. They're all part of your course! - And you keep them - they're yours!



I Offer You All These!

Basic Lesson Texts, Diesel Installation & Maintenance Instructions, Spare Time Lessons, Engine Service Manuals, Engine Repair Drive Systems, Diesel Electric Power Texts, Special Thermodynamic Instruction.

Attention: Men Going into the Service Soon!

With National Schools training in Radio-Television or Automotive-Diesel, you have the opportunity to get into special service classifications. That means higher pay and grade, more prestige - right away! This is important - so be sure to mail the coupon today without fail.

WHICH OF THESE HIGH-PAYING JOBS WOULD YOU LIKE?

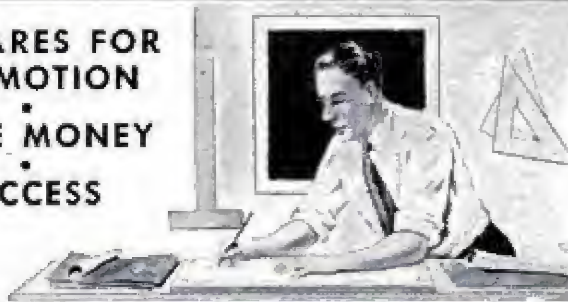
- MOTOR TUNE UP SPECIALIST
- DIESEL ENGINE SPECIALIST
- FARM EQUIPMENT MECHANIC
- YOUR OWN GARAGE OR REPAIR SHOP
- GENERAL GARAGE MECHANIC
- PARTS DEALER
- AUTO ENGINE REBUILDING
- FUEL INJECTION SPECIALIST

You can have secure jobs like these. Just mail the coupon - and find out!

NATIONAL SCHOOLS TECHNICAL TRADE TRAINING SINCE 1905
LOS ANGELES 37, CALIFORNIA

C. T. C. TRAINING IN DRAFTING

PREPARES FOR
PROMOTION
MORE MONEY
SUCCESS



"Here I am at work making good money as a draftsman. I'm glad I sent the coupon to Chicago Tech for that Free Trial Lesson and found out how easy it is to learn Drafting in spare time at home. Today, I feel secure in my job. What's more, I feel I'm slated for promotion and more pay."

LEARN IN SPARE TIME—AT HOME!

(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. All the tools you need; drawing outfit included. This tested method—developed over 48 years of C.T.C. progress—prepares men quickly for good positions in industry.



FREE INFORMATION—SEND COUPON

To prove to you how easy it is to learn Drafting at home, we will send you this FREE TRIAL LESSON. Mail coupon or send post card today.

CHICAGO TECHNICAL COLLEGE

E-250 Tech Bldg., 2000 So. Michigan Ave.,
Chicago 16, Illinois

Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

UNLIMITED OPPORTUNITIES IN ENGINEERING

DEGREE
IN 27 MONTHS

Study Engineering in this world-famed school, established 1884. Demand for our graduates exceeds supply. Growing shortage of engineers. No field offers greater opportunities for responsible, lucrative positions.

Bachelor of Science Degree in Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (Television) Engineering; Business Administration and Accounting. Also 36-weeks certificate course in Surveying and Drafting.

Personalized Instruction. Accelerated courses. Non-essentials eliminated. For ambitious, earnest students. Earn your degree in the shortest possible time. Preparatory courses. Placement service.

Extensive Campus. Well equipped, new and modernized buildings; up-to-date labs. Low cost. New terms start quarterly. Enter September, January, March, June.

Write today for free catalog and special information.



TRI-STATE COLLEGE

422 College Ave. ANGOLA, INDIANA

SAVE 50% - THOUSANDS HAVE ASSEMBLED

\$42^{UP}

PACKAGED BOAT KITS



27 MODELS

Dinghies, skiffs, racers, inboards, outboards and cruisers. Assemble your own boat, it's easy, it's fun!

All parts pre-cut or pre-fabricated from finest materials. Get all the facts from our big 24 page catalog. See how Packaged Boats are built, how they perform, how exclusive construction features make assembly easy. Includes specifications, performance data plus hardware and points.

SEND 25¢ for NEW 24 PAGE CATALOG

CUSTOM-CRAFT - DEPT. 7 - BUFFALO 7, N. Y.

BOAT PLANS PATTERNS

► Over 50 modern plans and full size patterns. Racing classes, cruisers, inboards, outboards, sail boats. By famous designers. 6' to 30'. DESIGN CATALOG 35¢. Design Catalog and boat building handbook, \$1.00

MARINE MART - DEPT 7 - BUFFALO 7, N. Y.

Do FALSE TEETH Rock, Slide or Slip?

FASTEETH, an improved powder to be sprinkled on upper or lower plates, holds false teeth more firmly in place. Do not slide, slip or rock. No gummy, gooey, pasty taste or feeling. FASTEETH is alkaline (non-acid). Does not sour. Checks "plate odor" (denture breath). Get FASTEETH at any drug store.



TOOTHACHE?

Ask your Druggist for **DENT'S**

TOOTH GUM
TOOTH DROPS
POULTICE



GOLD-SILVER-COINS

Easily located with new Lightweight M-Scope Detector. Superior performance, lowest price, monthly payment plan.

FREE LITERATURE
FISHER RESEARCH LAB., INC.
PALO ALTO CALIF.

SAY YOU SAW IT IN POPULAR MECHANICS

\$5000.00 in PRIZES

DRAW MY HEAD

YOUR DRAWING JUDGED & ANSWERED

1st & 2nd Prizes
Complete \$130.00
ART COURSES

80 other VALUABLE PRIZES



Take this test and try for a thrilling prize. Discover if you have profitable art talent. You may gain a lifetime of happiness and high earnings if you mail your drawings today. Amateurs only. Our present students not eligible. Copy this girl 4" to 6" high in pen or pencil, and mail to us. None returned. Winners notified. New \$5000 contest each month. Your drawing will be entered in contest for the month in which we receive it. Send your drawing now and include your name, address, age and occupation. Enter today.

WALLER ART EXCHANGE, Studio 84, 1000 N. CHARLES ST. BALTIMORE-3, MD.

**BE AN
ARTIST
WRITE FOR
FREE BOOK**

**NOW... GET EVERYTHING YOU
NEED TO LEARN AND MASTER**

TELEVISION

**RADIO-ELECTRONICS
...AT HOME!**

Use REAL commercial-type equipment to get practical experience

Your future deserves and needs every advantage you can give it! That's why you owe it to yourself to find out about one of the most COMPLETE, practical and effective ways now available to prepare AT HOME for America's billion-dollar opportunity field of TELEVISION-RADIO-ELECTRONICS. See how you may get and keep the same type of basic training equipment used in one of the nation's finest training laboratories... how you may get real STARTING HELP toward a good job or your own business in Television-Radio-Electronics. Mail the coupon today for complete facts — including 89 ways to earn money in this thrilling, newer field.

D.T.I., ALONE, INCLUDES BOTH MOVIES and HOME LABORATORY In addition to easy-to-read lessons, you get the use of HOME MOVIES — an outstanding training advantage — plus 16 big shipments of Electronic parts. Perform over 300 fascinating experiments for practical experience. Build and keep real commercial-type test equipment shown at right

Get BOTH of these information packed publications FREE!

89 WAYS TO EARN MONEY IN TELEVISION RADIO ELECTRONICS

You GET ALL 6

MODERN LABORATORIES

If you prefer, get all your preparation in our new Chicago Training Laboratories—one of the finest of its kind. Ample instructors, modern equipment. Write for details!

MILITARY SERVICE!

If you're subject to military service, the information we have for you should prove very helpful. Mail coupon today.

ACT NOW! MAIL COUPON TODAY!

DE FOREST'S TRAINING, INC. DEPT. PM-5-1
2533 N. Ashland Ave., Chicago 14, Ill.

Without obligation, I would like your Opportunity News Bulletin showing "89 Ways to Earn Money in Television-Radio-Electronics"; also, the folder showing how I may prepare to get started in this thrilling field.

Name.....Age.....
Address.....Apt.....
City.....Zone.....State.....



17 INCH TUBE

Here's the REAL THING!

SET UP YOUR OWN HOME LABORATORY



R-F Signal Generator



Oscilloscope



6-Tube Radio



Multimeter

Home Movies

"ONE OF AMERICA'S FOREMOST TELEVISION TRAINING CENTERS"

De FOREST'S TRAINING, INC.
CHICAGO 14, ILLINOIS
A De VRY INSTITUTION

YOU
can
acquire

LAW NIGHTS AT HOME! L. B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you learn by doing—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY A Correspondence Institution

417 S. Dearborn St. Dept. 564L Chicago 5, Ill.

Send me your two FREE booklets described above, without obligation.

Name.....Age.....

Street.....

City, Zone & State.....



"Toro makes America's most complete line of power mowers!"

Write TORO, Dept. M52, Mpls. 6, Minn.

Tells How You Can Learn to



Learn At Home

Men, Boys, Hunters, Fishermen, mount and save your lovely wild-game trophies. Be a Taxidermist. Mount Birds, Animals, Heads, Fish, Tan skins. YOU learn easily, quickly in spare time. Have a grand home-museum. The finest and the greatest hobby known, for sportsmen. Fun, real profits.

FREE BOOK

Yes, FREE. Beautiful strange, valuable Book, telling all about Taxidermy. Contains over 100 beautiful scene-pictures. And it's yours FREE, if you rush your request. You can mount all kinds of wild-game, and common specimens too. We can positively TEACH YOU. So GRASP this opportunity. RUSH letter or postal for this amazing FREE BOOK. Don't delay. State your AGE. N. W. SCHOOL OF TAXIDERM, 2505 Elwood Bldg., Omaha 2, Neb.

GET THIS FREE BOOK!

WHY DON'T YOU WRITE?

Writing short stories, articles on business, sports, hobbies, travel, shop crafts, local and club activities, etc., will enable you to earn extra money. In your own home, on your own time, the New York Copy Desk Method teaches you how to write the way newspaper men learn—by writing. Our unique "Writing Aptitude Test" tells whether you possess the fundamental qualities essential to successful writing. You'll enjoy this test. Write for it, without cost or obligation.

NEWSPAPER INSTITUTE OF AMERICA

SUITE 5592-E, ONE PARK AVENUE, NEW YORK 16, N. Y.

RUPTURE



RELIEF...OR YOUR MONEY BACK
Original, patented Web,
copied but never matched.
Users say it's best ever. Relief
or no cost to you. Write:

WEB TRUSS CO., Dept. M-5, Hagerstown, Md.

SHORTHAND IN

Famous Speedwriting Shorthand system. No symbols; no machines. Uses ABC's. Easy to learn, write, transcribe. Low cost. 100,000 taught by mail. Also typing. 29th year. Write for FREE booklet to:

Speedwriting

Dept. 1505-2

55 W. 42 St., N. Y. 18, N. Y.

6
WEEKS
AT HOME

RADIO

Engineering. All phases radio & electronics theory & practice; television; FM; broadcasting; servicing; aviation, marine & police radio. Prepare for high pay: 18-month course equal in radio content to 4 yrs. college. Enter Jan., March, June, Sept. Regular campus life. Catalog. VALPARAISO TECHNICAL INSTITUTE, Dept. D, Valparaiso, Ind.

WEATHER DAMP—Car Won't Start?

SHORTSTOP

starts damp motors quick

Just press button on handy aerosol can and spray plugs and wires. New, improved formula contains silicone. One treatment protects for months.

Get Shortstop at your service station, garage or auto supplies store.

ZACO LABS • 1360 W. 9th, Cleveland, O.

It Really Works

LURES, TRAPS, KILLS FLIES

BIGSTINKY OUTDOOR FLY TRAP!

Big Stinky's control fluid aids in producing potent scent attractive to pesky flies — lures those in immediate vicinity — traps, then kills them! It's self-regenerative — feeding on the flies it kills. It really works!

Get Big Stinky now
At Leading Dealers Everywhere!

THE DIOPTRON CO. MILWAUKEE 1, WISCONSIN



COMPLETE NEW

**FALSE IN 24
PLATE HOURS**

FROM YOUR OLD
NOW LOW AS... **\$13.95**

New process transforms old, broken or loose plates into new lightweight plastic plates.

NO IMPRESSION NEEDED. Let us help you enjoy life again. You will marvel at this revolutionary new method. Using your own old plates, we will remake them completely in only 24 hours. Missing teeth are carefully matched and replaced. Work is done on an absolute **MONEY BACK GUARANTEE**. Quit Suffering!

SEND NO MONEY —Just rush your name and address for full FREE DETAILS. If your teeth are loose, we'll tell you how to tighten them before duplication. Act now. Tru-Grip Dental Labs., 7th Fl., 127 N. Dearborn, Dept. 141, Chicago 2, Ill.



TRAIN AT HOME FOR TOP PAY JOBS IN BUILDING CONSTRUCTION

Nearly a million dwellings will be erected this year. Thousands of jobs at top pay waiting. Learn Building Construction in months thru easy home study. Course can save thousands if you plan to buy or build. Write for booklet.

**COMMERCIAL TRADES INSTITUTE, Dept. BC2-5
1400 Greenleaf Ave. Chicago 26, Illinois**



CARTOONING

HAVE FUN! MAKE MONEY! Cash in on your sense of humor AT HOME—BY MAIL! No experience needed to start. Write today FOR FREE TRIAL LESSON and full particulars. **MOON Gag Cartoon School, Dept. M, Fall Creek, Wis.**

HIGH POWER TELESCOPE

60 POWER—ALUMINUM TUBES—OPENS TO 33"
Variable Power Adjustable to 15X, 30X, and 60X.
\$5.95

5 Sections, 4 Ground & Polished Lenses. Also used as 50X Microscope. Ready to use, only \$5.95. **POSTPAID.**
CRITERION CO. 438 ASYLUM ST. HARTFORD 3, CONN. DEPT. AP 5

SAY YOU SAW IT IN POPULAR MECHANICS

Amazing AUTOMATIC Refrigerator Defroster



PAYS SALESMEN UP TO \$210 A WEEK

Leave amazing new Automatic Refrigerator Defroster on FREE Trial overnight. Come back in 3 days and collect your profits. Housewives delighted when they see how plug-in D-Frost-O-Matic ends messy defrosting forever. Free Trial Plan. Write

D-FROST-O-MATIC 173 W. Madison Street Dept. HX-60, Chicago 2

NOW! HERE'S HOW TO

Fix ANY Car

IN LESS TIME...

and do a better job too!



NEW 1952 Edition of Famous MOTOR'S Manual Shows You How To Repair — Quickly and Easily—Any Car Built from 1935 THROUGH 1952!

FREE 7-DAY TRIAL

NO job is too tough when you've got MOTOR'S brand-new AUTO REPAIR MANUAL. Shows how to save work on "ornery" jobs. Helps you make **MORE MONEY** by doing *more*

jobs in less time! Now covers 1952 models; up-to-date information on all new automatic transmissions and carburetors.

COMPILED FROM 170 OFFICIAL FACTORY SHOP MANUALS!

This great book—over 780 BIG 8 1/2" x 11" pages—brings you the complete "dope" from 170 Official Factory Shop Manuals, boiled down in simple easy-to-understand language. 2400 cut-away photos, diagrams, drawings show **WHAT** to do, **HOW** to do it. 225,000 service and repair facts! 851 car models! Now YOU can try it **FREE**—for 7 days.

COVERS 851 MODELS BUILT SINCE 1935!

- | | |
|-----------|-------------|
| Auburn | Lafayette |
| Burn | La Salle |
| Austin | Lincoln |
| Bantam | Mercury |
| Buick | Nash |
| Cadillac | Nash |
| Chevrolet | Rambler |
| Chrysler | Oldsmobile |
| Crosley | Packard |
| De Soto | Plymouth |
| Dodge | Pontiac |
| Ford | Studebaker |
| Frazier | Terraplane |
| Henry J | Willys |
| Hudson | and others! |
| Kaiser | |

Same FREE Offer On MOTOR'S Truck and Tractor Manual

Latest Edition! Covers EVERY job on EVERY popular make gasoline truck, tractor, stock engine made from 1935 thru 1951, 928 big pages, 300,000 facts, 3267 pictures. Check proper box in coupon. **FREE 7-Day Trial.**



SEND NO MONEY

Mail coupon below — *without money!* When your book arrives—*make it show you what it's got!* Unless you agree it's the greatest time and work saver you've ever seen—return book in 7 days, pay nothing. Mail coupon NOW! **MOTOR Book Department, Desk 1E, 250 West 55th Street, New York 19, N. Y.**

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MOTOR BOOK DEPT. Desk 1E, 250 W. 55th St., New York 19, N. Y.

Rush to me at once (check box opposite book you want):

MOTOR'S New AUTO REPAIR MANUAL. If O.K., I will remit \$1 in 7 days (plus 35c delivery charges). \$2 monthly for 2 months and a final payment of 50c one month after that. Otherwise I will return the book postpaid in 7 days. (Foreign price, remit \$8 cash with order.)

MOTOR'S New TRUCK & TRACTOR REPAIR MANUAL. If O.K., I will remit \$2 in 7 days, and \$2 monthly for 2 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$10 cash with order.)

Print Name.....Age.....

Address.....

City.....State.....

Check box and save 35c delivery charge by enclosing WITH coupon entire payment of \$5.95 for Auto Repair Manual (or \$8 for Truck and Tractor Repair Manual.) Same 7-day return-refund privilege applies.

Make your lawn furniture look like new!

Protect, preserve, beautify children's playground equipment, garden tools, metal screens



If you prize it—**KRYLON-ize** it!

Take Krylon Acrylic coating outside with you—and, next fall, your prized possessions will be as fresh and bright as you make them this spring! "Krylon-izing" seals out water, air, moisture, dirt. Rustproofs metal. Practically banishes wear and tear on almost any metal, wood, leather, paper object. So easy to use—just press a button, spray it on. Dries quickly, lasts indefinitely. Waterproof, non-flammable. Won't change color, crack or dry out. You clean "Krylon-ized" objects with the touch of a damp cloth.

CRYSTAL CLEAR, BRIGHT WHITE, ALUMINUM

Clear is transparent as glass. Colors last longer, clean easier, are easier to apply than paint or enamel. Get all of them at your hardware counter in 12 oz. aerosol spray cans.

KRYLON, INC., 2601 N. Broad St., Philadelphia 32, Pa.

EARN SPARE MONEY

\$\$\$\$\$\$

CASH IN ON PROFITABLE WELDING JOBS AT HOME

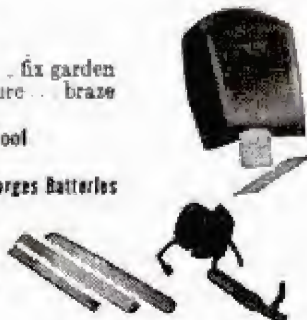


Repair damaged fenders and bodies... fix garden tools and toys... build metal furniture... braze... solder... charge car batteries.

Handiest Home Workshop Tool LINCWELDER 60

Welds • Cuts • Solders • Brazes • Charges Batteries

- Easy to use... comes complete with instructions
- Simple to install... operates on 115 volt grounded circuit (No. 12 wire fused for 20 amps.)
- Approved by Underwriter's Laboratories.
- Built by The Lincoln Electric Co., The World's Largest Manufacturer of Arc Welding Equipment.



ORDER NOW

Fill out and mail to Dept. 193, The Lincoln Electric Co., Cleveland 1, Ohio

- Ship me the "Lincwelder 60" with accessories \$48.00. (Including headshield, electrodes, carbons, electrode holder, ground clamp and cable.) Arc Torch \$6.25 extra.
- Battery Charging Attachment \$10.00 extra.
- Enclosed is check money order
- Send me free bulletin on the new "Lincwelder 60."

Name _____

Address _____

City _____

State _____

193

BE A FROGMAN!



Join the new national FROGMAN CLUB today. All you have to do is send \$1.00—be sure to include your name and address—and here's what you get:

- 1) A miniature pair of Frog Feet. Can be worn on key chain, lapel or hung on windshield as lucky charm.
- 2) An attractive membership card.
- 3) A Frogman decal to be used on your windshield, bicycle or notebook.
- 4) A booklet on "How To Swim Underwater" and "The Supreme Sport of Spearfishing".
- 5) Periodic bulletins on the latest developments in Frogman equipment and news.
- 6) Complete catalog of Frogman equipment available for purchase.
- 7) A free coupon for \$1.00, which can be used toward the purchase of a pair of regular size Frog Feet, \$6.95 or equivalent in value. This is redeemable at your local sporting goods dealer, drug store, auto supply store or toy departments. If no such dealer available in your area, we will handle direct.

BE A FROGMAN — Send your dollar today!

National Frogman Club

1428 Maple Avenue, Dept. PM-5, Los Angeles, 15, Calif.

'How' to MAKE MONEY with Simple CARTOONS



A book everyone who likes to draw should have. It is free; no obligation. Simply address **FREE BOOK**

CARTOONISTS' EXCHANGE

Dept. 95D Pleasant Hill, Ohio

"YOU ARE UNDER ARREST!"



Help Bring Crooks to Justice Through Scientific CRIME DETECTION!

We have taught thousands this exciting, profitable, pleasant profession. Let us teach you in your own home. Learn Fingerprinting, Firearms Identification, Police Photography, Secret Service Methods thoroughly, quickly, at small cost. Over 600 of all American Bureaus of Identification employ I. A. S. students or graduates. We can prepare you for this fascinating work, during spare time. Write today, stating age, for "Blue Book of Crime."

INSTITUTE OF APPLIED SCIENCE, 1920 Sunnyside Ave., Dept. 1355, Chicago 40, IL

SPARE TIME PROFITS EARN MONEY AT HOME

Cash in on this pleasant and profitable business. Re-string Rackets full or spare time. No experience or skill required. Easy to learn. Full line of finest quality, guaranteed Stringing Tools, Frames, Gut and Nylon Strings. Don't Delay Act Now!



FREE CATALOG and instructions WRITE TODAY

W. A. BICKEL & CO., 803 South Blvd., Dept. PM-5, Oak Park, Ill.



ITALIAN ACCORDIONS

Hand Made. Very Best. Buy Direct from Factory Representative at lowest wholesale prices and Save Money. Send Name and Address for FREE catalog.

ITALIAN ACCORDION MFG. CO.

7600 Cottage Grove Ave., Dept. PM-5, Chicago 19, Ill.

GO PLACES LEARN ANOTHER LANGUAGE

EASILY — QUICKLY

IN 20 MINUTES A DAY

by LINGUAPHONE

World's-Standard CONVERSATIONAL METHOD

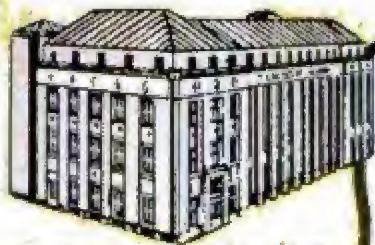
FRENCH
SPANISH
GERMAN
RUSSIAN
CHINESE
—29 Languages Available

Are interesting job, travel, armed services', cultural opportunities passing you by because you speak only one tongue? Learn AT HOME another language quickly, easily by LINGUAPHONE CONVERSATIONAL METHOD. YOU LISTEN—you learn—you understand—you SPEAK. World-wide educational endorsement: over a million home-study students. FREE BOOK gives fascinating facts. WRITE TODAY! Approved for VETERANS' Training.

LINGUAPHONE INSTITUTE

143-05 Radio City

New York 20, N. Y.



CRESCENT SCHOOL

"One of the largest schools of its kind"

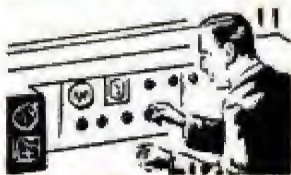
I WILL START YOU
on a **HIGH PAYING CAREER**
in **RADIO-TV SERVICING**
FREE!



Dr. Alexander Schure
B.S., M.A., Ph.D.



INCREASED EARNINGS



INTERESTING WORK



AN UNLIMITED FUTURE

**BIG DEMAND
FOR TRAINED MEN**

All of the advantages of higher earnings, an interesting job with prestige and a truly unlimited future in a fast-growing field await men trained in RADIO and TV! This training can help earn extra pay and rank in the ARMY, NAVY and AIR FORCE!

LEARN AT HOME
in your spare time!

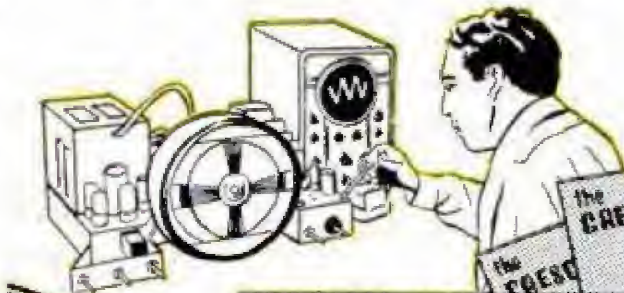
"Now you can prove to yourself that you can have a profitable career in RADIO and TELEVISION—at no cost to you! The free booklet I send you is actually an illustrated, simplified CRESCENT SCHOOL lesson on how to make basic TV adjustments. With it you can start earning extra cash in your spare time—immediately! Don't wait...send for this valuable FREE offer today!"

COMPLETE TV-RADIO SERVICING COURSE

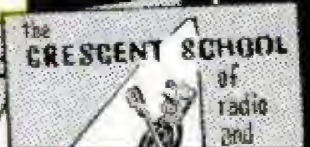
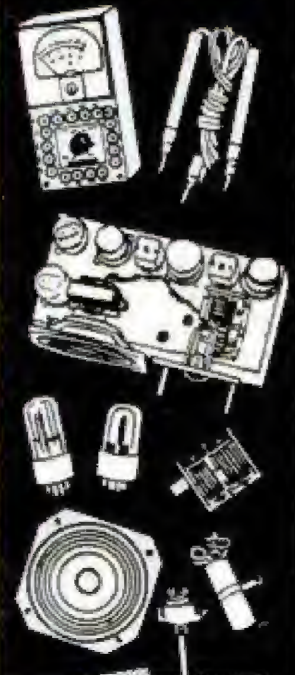
The famous CRESCENT SCHOOL course is available to you complete for home study! New simplified, illustrated lessons show you the latest techniques—no previous training needed! Carefully selected parts-kit included with the course: you learn by doing! Complete the course as quickly as you can learn; CRESCENT SCHOOL certificate—recognized by industry—awarded upon completion.

PAY AS LITTLE AS
\$5 MONTHLY

Total cost for complete course
as little as **\$100**



PARTS-KIT INCLUDED
in complete course
Learn by Doing



SEND COUPON TODAY
for sensational
FREE OFFER!

CRESCENT SCHOOL Dept. B-5
500 Pacific St., B'klyn 17, N. Y.

Dr. A. Schure: Rush FREE booklet illustrating basic TV adjustments, and full details about the CRESCENT SCHOOL Home Study Course—all at no obligation to me!

NAME
ADDRESS
CITY.....ZONE.....STATE

**YOU ARE
IN DEMAND**
if you can draw!



Make money with your brush and pen! If you like to draw, sketch, or paint, take the FREE Talent Test. No fee. No obligation. Mail this coupon TODAY!

ART INSTRUCTION, INC.

Dept. 5132+500 South 4th St.
Minneapolis 15, Minn.

Please send me your FREE Talent Test.

Name _____

Address _____

Age _____ Phone _____

City _____ Zone _____

County _____ State _____

Occupation _____

**THIS HANDBOOK
FOR AMBITIOUS MEN
FREE!**



Have you had your copy?

150 pages of guidance to best-paid positions. Up-to-the-minute information for men who want to climb to the top. Tells how to get promotion, security and better pay through home study courses. This handbook "Engineering Opportunities" is free and entirely without obligation. Send the coupon. Make this your big year! Describes over ninety courses including:

- | | | |
|-----------------|---------------|-------------|
| Mechanical Eng. | Electrical | A.F.R.Ae.S. |
| Aeronautical | Radio | A.M.I.C.E. |
| Television | Automobile | B.S. (Pure |
| Building | A.M.I.Mech.E. | Science) |

--- SEND COUPON TODAY ---

Canadian Institute of Science & Technology Limited, 536 Century Building, 443, 5th Street, N.W., Washington, D.C.

Please forward free of cost or obligation your handbook, "ENGINEERING OPPORTUNITIES".

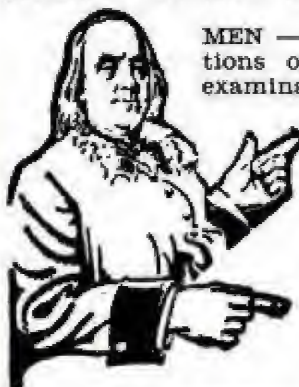
Name.....

Address.....

Course interested in:..... Age.....

Canadian Address: Canadian Institute of Science 536 Garden Bldg., 263 Adelaide Street, W., Toronto 1

**Want A Gov't Job?
START HIGH AS \$3,795.00 YEAR**



MEN — WOMEN. Thousands of positions open. Prepare NOW for next examinations. Write immediately for free 32-page book, with list of positions and particulars telling how to prepare. Experience usually not required. Veterans get preference.

FRANKLIN INSTITUTE

(Not Government Controlled)

Dept. H-83,
Rochester 4, N. Y.

Find **HIDDEN TREASURES**

GEIGER COUNTERS for Uranium Detection. (see at left). **TREASURE DETECTORS** for gold, silver, etc. Lightweight, ultra sensitive. None finer at ANY PRICE. Information FREE.

Detectron co.
5631 Cahenga, No. Hollywood, Calif.

AVIATION

The aircraft industry urgently needs trained personnel. Here is YOUR opportunity for a rewarding and interesting future. Study Aeronautical Engineering, Engineering Drafting, Airplane and Engine Mechanics (approved by C.A.A.). Outstanding faculty, modern equipment. Part-time employment. Free placement service. Big demand for graduates. 23rd year. Founded by Curtiss-Wright. Write for free bulletin and "Opportunities in Aviation".

AERONAUTICAL UNIVERSITY

Dept. 75, 1905 Prairie Avenue, Chicago 16, Illinois

**Watch Repairing Pays
Big Money Learn at home**



Watch repairers in great demand. Train step-by-step in 10 easy lessons. We furnish all tools and 15 jewel watch and practice movement. Turn spare time into cash. A licensed school. Low cost. Send for FREE book today.

ILLINOIS SCHOOL OF WATCH REPAIRING

2870 Elston Ave., Dept. PM-52, Chicago 18, Ill.

Learn TELEVISION-ELECTRONICS RADIO

2 Big Books FREE

Train at Home — Get Big Kits of Radio Parts! Prepare now in spare time. Practical instruction. Approved for Veterans. Write for details and 2 Radio Books — ALL FREE! Rush name today!

SPRAYBERRY ACADEMY OF RADIO
Dept. 10-J 111 No. Canal Chicago 6, Illinois

JITTERBUG GETS MORE FISH

The old standby of anglers everywhere. Famous gurgling, paddling surface action makes the big ones strike viciously. Casting size (5/8 oz.) or spinning and light tackle size (3/8 oz.) — \$1.25 each. Musky size (1-1/4 oz.) — \$2.00 each.



Choice of Body Colors **NOISY SURFACE BAIT**

FRED ARBOGAST & CO., INC., 2245 W. NORTH ST., AKRON 3, OHIO

FREE WRITE TODAY FOR BIG FREE COLOR CATALOG OF-BAITS — FULL OF PICTURES OF CATCHES

don't paint it...



Spray it the modern easy way! with the **BVI** electric SPRAYER



PAINTS
furniture, doors, toys, etc.

AT LAST - A HIGHLY EFFICIENT, PROFESSIONAL TYPE LIGHT WEIGHT ELECTRIC SPRAYER! For only \$7.95, less than the cost of a good brush, you can save time, work and money! This brand new, recently developed electric sprayer weighs only 1½ pounds, yet is more efficient in handling oil or water based paints, varnish, enamel, shellac, lacquer, oils, disinfectants, insecticides, garden sprays, or most all types of liquids which can be sprayed.

**TRY IT
FREE
FOR 10 DAYS
AT OUR
RISK!**

COMPLETE - READY TO USE! There are no extras to buy in the "B.V.I." sprayer as it uses an 8-ounce mason jar which can be replaced instantly. Handy fingertip switch and 8-foot insulated cord permit easy handling and reaches into hard-to-get-at corners, ceilings, rough concrete, wood, screens, etc. The "B.V.I." requires no extra hose, compressors or tanks. Merely plug in, press the switch, and spray easily, effortlessly, and conveniently.

RENOVATES
scratches on cars, furniture, etc.

**PAYS FOR ITSELF
MANY TIMES OVER!**
When spraying or painting, you get a more uniform, professional appearing job that saves you time, effort and money. There are no brush marks to show, no drippings or paint splashes. All in all, you get a cleaner, more efficient job that you will be proud of.

FACTORY GUARANTEED!
You get a double guarantee both by the manufacturer, the Burgess Vibrationcrafters Inc., and Imperial Sales Co. If you find that you cannot get an efficient, professional type application, then return the "B.V.I." Sprayer within 10 days for complete purchase price refund.

EASY ADJUSTMENT! The "B.V.I." Sprayer applies paint smoother and faster than any brush, and with a convenient adjustable spray control. You can utilize a fine or heavy, thick or thin spray, whatever your needs may be for the job you are doing.

DISINFECTS
closets, rooms, receptacles, etc.

LUBRICATES
cars, bicycles, machinery, etc.

HUNDREDS OF USES!
You can use the handy "B.V.I." in and around the home for moth proofing closets, painting kitchen cabinets, spraying furniture, for insect control or any household item. You can use the sprayer outdoors for building surfaces, automobiles, toys and bicycles; in the garden for pest control; on your walks and patios. The "B.V.I." can be used on the farm and in the barn for livestock and equipment.

REACHES, SPRAYS
ceilings, all hard-to-get-at places

IMPERIAL SALES CO.
480 Lexington Avenue
New York 17, N. Y.

KILLS INSECTS
on flowers, plants, shrubs, etc.

**TRY AT OUR RISK
FOR 10 DAYS
RUSH COUPON ON OUR
MONEY BACK \$7.95
GUARANTEE**

ORDER TODAY! USE THIS HANDY COUPON!

IMPERIAL SALES CO. Dept. B-345
480 Lexington Avenue, New York 17, N. Y.

Please send me "B.V.I." Sprayers at \$7.95 each on your 10-day no risk offer. I will pay postman on delivery \$7.95 each plus delivery and handling charge.

I enclose check or money order. I understand I can save approximately 65 cents by prepaying.

NAME.....
ADDRESS.....
CITY.....ZONE.....STATE.....

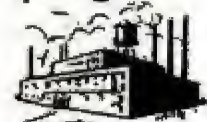
It is understood that the same 10-day guarantee applies whether I order the "B.V.I." Sprayer sent C.O.D. or remit \$7.95.



**MEN! TRAIN NOW FOR
A BIG PAY FUTURE IN
DIESEL
& SCIENTIFIC MOTOR TUNE-UP**



- Diesel Construction
- Diesel Engine Repairman
- Diesel Operator
- Industrial Maintenance
- Auto Engine Rebuilding
- Bus & Truck Maintenance



Be a Trained Diesel Man

Go places with DIESEL! Farms, factories and power plants, trains, ships, trucks, busses all use DIESEL POWER... all need DIESEL-trained men! You can start your DIESEL training at home, in spare time, with tested, proved U E I training. Course includes practical work on Diesel engines under skilled instructors. You learn the operation, maintenance, servicing of all types of Diesel engines, PLUS Scientific Motor Tune-up.

ACT NOW! If you have mechanical ability, you'll like Diesel! High School diploma not necessary. Write now for FREE book, "EARNING POWER IN DIESEL." Act Today!



MAIL NOW FOR FREE BOOK!

UTILITIES ENGINEERING INSTITUTE, Dept. DC-19,
2521 Sheffield Ave., Chicago 14, Ill. (Founded 1927)
O.K.I. Rush, without obligation, FREE Book on DIESEL.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____
 Check here for information if under 17.

**Learn this
Profitable
Profession**



**IN 90 DAYS
AT HOME**

**Money-Making Career Open
to Men and Women, 18 to 60**

Hundreds of men and women between 18 and 60 make \$10 to \$20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time income from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting money-making profession in your own home, through our home study course. Same instructors as in our nationally known resident school. You can win independence and prepare for future security by qualifying for your Graduation Certificate. Course can be completed in 3 to 4 months. Many earn while they learn. Begin your training at once.



NEW 32-PAGE BOOKLET FREE

Fill in the coupon below (please print name and address) and mail it for your FREE copy of 32-page Information Booklet. If you act at once we will include Anatomy Charts and Success Booklet which supply additional information you should have. All will be sent postage paid.

THE COLLEGE OF SWEDISH MASSAGE
Dept. 264E, 41 E. Pearson St., Chicago 11, Illinois

Please send me FREE and postpaid New 32-Page Illustrated Booklet, Anatomy Charts and Success Booklet at once.

Name _____ Age _____
Address _____
City _____ State _____

How to Always Have HOT WATER



Make Your Own Automatic Electric Water Heater now for only **\$19.95**

Money back in 10 days if not delighted. **INSTALL IN 5 MIN.**

Why suffer without hot water? Enjoy lots of it to wash, bathe, shave. Heater keeps water HOT in your present tank. Turns ON when needed—shuts OFF when water is heated. No flue, dirt, fire! No disturbing or draining of tank or pipes. Ideal for 30-gal. tanks! Heater screws into any size boiler top as shown. Plugs into outlet... 1320 w. 110 v. AC. (Also 2000 w. 220 v. model for 220 v. cable \$19.95)... works automatically thereafter. Temperature adjustable between 120 to 180 degrees. Replaces coal, oil, gas in home, store, summer cottage, green house, farm, barn, stock tank, poultry scalding, factory. Uses only 1/4 to 1/2 c electricity per gallon hot water. Why burn expensive main furnace unit for hot water? Send check or M. O. NOW; save postage, shipping charges. ORDER NOW... TODAY.

**ONE YEAR GUARANTEE
All Parts U. L. Approved**

COLLOID EQUIPMENT CO., INC. Dept. PMS, 50 Church Street, New York 7, N. Y.

**Spot ANY Car Trouble—
in a Jiffy!**

Amazing new Auto "Trouble-Shooter" helps find what's wrong FAST!

NOW you can put your finger on just about EVERY cause of car trouble—simply by turning to indexed check-list in MOTOR'S amazing NEW "TROUBLE SHOOTER." Section on automatic transmission ALONE is worth price of book! SEND NO MONEY. TRY BOOK AT OUR RISK. Helps you track down noises, knocks, misses, breakdowns. Includes valuable cross-section pictures. Covers 2000 specific causes of car, truck troubles—engines, clutches, brakes, ignition, cooling system—all other parts. Valuable for beginner or mechanic. Write MOTOR Book Dept., Box CU, 357 West 33 Street, New York 19, N. Y. Pay postman \$1, plus C.O.D. chg., on delivery. Use 7 days. If not delighted, your \$1 back. (SAVE C.O.D. cost by sending \$1 now.)



**NOW! Complete Protection in the Rain
RAIN-ZIP COVERALL**

with detachable parka hood. Ideal for Fishing, Hunting, Boating, Working. Only **\$4.95**
Roomy swing action Raincoat of famous Firestone Velon. Zip closing. Folds wet or dry into pouch. Sizes: small, medium, large. Money-back guarantee. Order today. We pay postage except on COD's.



GARDINER PRODUCTS
18 E. 11th. Dept. PM-5 Kansas City 6, Mo.

**WARN HUB CAP MAKES
2 JEEPS OUT OF 1!**

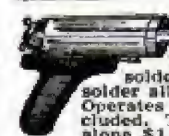
Ends front wheel drag on 4-wheel drive Willys Station Wagons, Pick-ups and Jeeps. Saves gas up to 3 miles per gallon, tire wear, front axles, increases speed and power. Stops shimmy—front wheels coast out of gear! 4-wheel drive handles, 2700° F. flame. Operates in any position, indoors or out. Pint of special fuel included. TORCH alone with pint of special fuel \$6.50. KIT alone \$1.50. Add 35c on each order towards shipping charges. AMERICAN PRODUCTS CORP., 422 S. Dearborn, Dept. 3-E, Chicago



\$20.00
Prepaid U.S., Canada

SILVER SOLDER TORCH & KIT \$7.50

JOINS ALL METALS PERMANENTLY
Do your own repairing. KIT includes one tube silver solder "XCEL-FLUX" paste and 10 3-in. lengths silver solder alloy. Hottest ALCOHOL TORCH known, 2700° F. flame. Operates in any position, indoors or out. Pint of special fuel included. TORCH alone with pint of special fuel \$6.50. KIT alone \$1.50. Add 35c on each order towards shipping charges. AMERICAN PRODUCTS CORP., 422 S. Dearborn, Dept. 3-E, Chicago



SAY YOU SAW IT IN POPULAR MECHANICS

**RUPTURED?
Get Relief This Proven Way**

Why try to worry along with trusses that gouge your flesh—press heavily on hips and spine—enlarge opening—fail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening—follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing FREE book, "Advice To Ruptured" and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

CLUTHE SONS, Dept. 31, Bloomfield, New Jersey.

MAKE EXTRA MONEY

PLASTICS LEARN AT HOME

LEARN HOW TO MAKE fast selling PLASTIC NOVELTIES FURNITURE JEWELRY SIGNS TOYS LAMPS

There are RICH OPPORTUNITIES for MEN and WOMEN with "know-how" in Plastics. Interstate's amazing new Plastics course tells and shows how to make hundreds of fast selling items out of Plastics. Gives complete training in fabrication, casting, lamination, molding, etc., in simple, easy, step-by-step language and pictures.

START A PLASTICS BUSINESS OF YOUR OWN. No other industry holds such promise for the future. You can make big money manufacturing novelties, toys, signs, etc., in your own home in spare or full time. Don't wait! Learn NOW how Interstate's Plastics Training qualifies you for success in the plastics field.

Write for FREE Information Today!

INTERSTATE TRAINING SERVICE

School of Plastics, Dept. C-3E
PORTLAND 13, OREGON

DAN LURIE
"America's Most Muscular Man"
—on television's "Big Top"

FAMOUS DAN LURIE

BARBELLS

with 4 courses—low factory prices
50 lb. set...\$ 8.48 | 150 lb. set...\$20.48
100 lb. set... 13.98 | 200 lb. set... 25.98

Write for Free Catalog Order by Mail; 50% with order, bal. C.O.D. Extra wts. 15c per lb., F.O.B. plant

DAN LURIE BARBELL CO.

1701-M5 Pitkin Ave., Dept. 299-E, Brooklyn, N. Y.

Learn ACCOUNTING Business Administration

Bookkeeping, secretarial and allied subjects at home in your spare time or attend nationally approved resident school. Write for FREE Success Book giving complete information about courses, plans, rates and employment opportunities.

Hills BUSINESS UNIVERSITY AND EXTENSION SCHOOL

619 W. MAIN ST. OKLAHOMA CITY 2, OKLAHOMA

Learn TATTOOING At Home

Earn extra MONEY—Tattoo blood types and designs in your community. Splendid opportunity in every town. Prepare in spare time. Practical instructions. Send 25c for details and list of Tattoo Supplies. No obligations. THIS SCHOOL OF TATTOOING • 726 Leslie, Rockford, Ill.



BE A LOCKSMITH

Learn Locksmithing and Keymaking from Experts in Your Spare Time at Home! Locksmiths in big demand! No layoffs, no slow seasons! Age no disadvantage. Year-round, steady income in this permanent, respected field. Full or part time. Practical, illustrated lessons show how to make money even while learning! All materials, special tools supplied. FREE BOOKLET.

INSTITUTE OF LOCKSMITHING, Dept. P-30
15 PARK AVE. RUTHERFORD, N. J.
Lic. & Approved State of N.J. VA Approved

TOOLS AT WHOLESALE

DIRECT FROM FACTORY

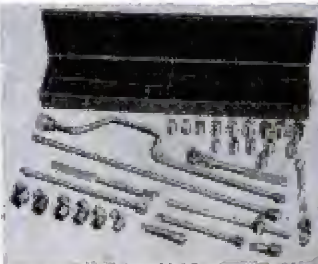
Full line of top quality, fully guaranteed, chrome, factory-new mechanics hand tools. You save HALF REGULAR PRICE for tools of this quality.

Pay EASY MONTHLY TERMS

WRITE TODAY FOR FREE CATALOG

MECHANICS CO-OP

Dept. A OAKLAND 8, CALIFORNIA



BECOME AN Electrical Engineer



- Major in Electronics or Power
- B.S. Degree in 36 months
- Television Technician
- Certificate in 18 months

FOLLOW THIS PLAN

By 1954 there will be at least two positions for every engineering and technician graduate. Enter these opportunities early... earn your B.S. Degree in 36 months through optional year 'round study.

TELEVISION TECHNICIANS are needed throughout America's fastest growing industry.

You become a Radio Technician in 12 months. In 6 additional months become a Radio-Television Technician. These Technician Courses are complete in themselves and can be applied as one-third of the B. S. Degree program.

Military, Practical, or Academic training evaluated for advanced credit. Faculty of specialists. Over 48,000 former students from all states and 23 overseas countries. Nonprofit.

MILWAUKEE

SCHOOL OF ENGINEERING

TERMS OPEN APRIL, JULY, OCTOBER, JANUARY
Founded 1903. Milwaukee, Wis.

Write for free 110-page catalog, 48-page pictorial booklet "Your Career" and "Occupational Guidance Bulletins."

MILWAUKEE SCHOOL OF ENGINEERING
Dept. PM-552, 1025 N. Milwaukee,
Milwaukee, Wisconsin

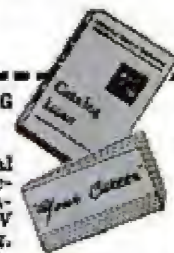
Without obligation send Catalog for Electrical Engineering, B. S. Degree, major in Electronics; Power; "Your Career"; Occupational Guidance Bulletin on: Radio-TV Electrical Power Welding Heating, Refrigeration, Air Conditioning; TV Clinic.

Name.....Age.....

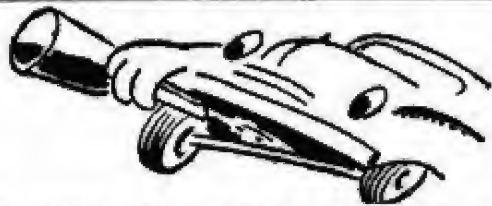
Address.....

City.....Zone.....State.....

If veteran, indicate date of discharge.....



STOP THAT OIL EATER!



GET NEW CAR PERFORMANCE WITH PISTON SEAL WITHOUT COSTLY OVERHAULING

Piston Seal—the amazing compound that forms a self expanding, pliable lubricating seal around pistons that compensates for wear. Eliminates oil burning, restores power and compression. Can be applied in a few minutes.

GOOD FOR 10,000 MILES



FOR COMPLETE, FREE DETAILS WRITE TO

RICHIE DISTRIBUTING CO. 11916 Madison Ave., Dept. E, Cleveland 7, Ohio



SEND NO MONEY • MORE THAN 4000 PAGES • 2750 PICTURES

9 BIG COMPLETE BOOKS BUILDING, ESTIMATING, CONTRACTING

Examine this Up-to-Date Edition for 10 days. See how these nine books supply easily understood training that will help you to get a better job and make more money, or start a profitable business for yourself. Think what a BIG help it will be to have them handy for use in solving all sorts of building problems.

Learn to draw plans, estimate, do all-new construction and modern remodeling to meet fast growing demand. More than 4000 pages of practical, pay-raising information with 2750 helpful illustrations, on such subjects as blueprint reading, concrete forms, masonry, carpentry, steel square, electrical wiring, plumbing, heating, painting, and hundreds more.

In our more than 50 years we have never offered more complete building information. Send the coupon TODAY.

(A year's consulting privileges with our engineers now given with these books without extra cost.)

AMERICAN TECHNICAL SOCIETY—Publishers Since 1898
Dept. G519, Drexel Ave., at 58th St., Chicago 37, Ill.

I would like to examine your 9-Volume Set of Building, Estimating, Contracting Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you \$3 and pay the balance at the rate of only \$4 a month until \$34.80 has been paid. Include consulting service as offered above.

Name _____

Address _____

City _____ State _____

Please attach letter giving employer's name and address (if self-employed give business man reference). Men in service please give home address.

BUY DIRECT from MF'GR and SAVE • SATISFACTION GUARANTEED



4x8 FT. WT. 2 LBS.
NYLON PONCHOS, \$3.95 ea.

2 MAN, ALL-NYLON PUP TENT

Wonderful for children — backyard fun. For dad on camping trips. Easy to handle—folds away into compact unit. Brand new 100% nylon waterproofed cloth pup-tent comes with grommets and loops with poles and pins. Army camouflage green. **\$6.95** plus 40c sh. charge.

BRAND NEW NYLON STORAGE COVERS

for outdoor storage of cars, boats, machinery, equipment, etc.

Strongest, lightest covers ever made. New DuPont Nylon 2-ply with fused waterproof coating on nylon cloth. Folds away easily. Secured with heavy elastic. Protection against wind, rain, sun, salt-air, mildew, etc. 15-day money-back guarantee. Not to be confused with plastic covers selling for less!



Give Standard Size Car Model **\$16.95**

Lightweight only 5 1/2 lbs.

Extra Large Size for Cad-dy, Lincoln, etc. \$2.50 extra

plus 60c postage

DEFENDER TEXTILE CORP., 317 Canal St., Dept. PM, N.Y. 13, N.Y.

Secrets of VENTRILOQUISM Now Revealed!



Easy to learn in 60 to 90 days with our Home Study Course. **RESULTS GUARANTEED.** Make Money! Be Popular! Have Fun! Big Opportunity! Radio, Television, Stage Appearance! For FREE Information regarding price and terms, WRITE. You must state your age. Dummy Catalog 25c.

FRED MAHER SCHOOL OF VENTRILOQUISM
Box 36, Studio E Kensington Station Detroit 24, Michigan

WHAM-O SPORTSMAN * \$1.50

HITS LIKE A .22 RIFLE—KILLS RABBITS, SQUIRRELS. Powerful, silent, accurate. For hunting, target, roofing pests.

Sportsman's choice sold world over!



HUNTING SLINGSHOT

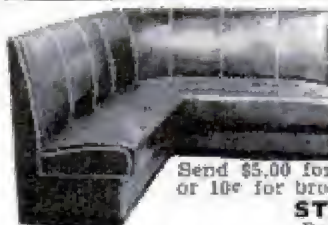
Heavy duty 7" ash stock.

40 steel balls, extra rubber target.

GUARANTEED. At dealers, or send \$1.50 to

Wham-O Mfg. Co. Box 87, South Pasadena, Calif.

* Professional model of Nat'l Slingshot Assn.



Anybody Handy With Tools Can Build **LEATHER LOUNGES FOR KITCHENS AND RESTAURANTS**

Frames, springs, filling, construction simplified.

Send \$5.00 for complete plans and instructions, or 10c for brochure.

STEFAN GALENSKI

Designer & Manufacturer

2221 BROADWAY

BUFFALO 12, NEW YORK

"I HAVE EARNED \$1520 AN HOUR" AN AVERAGE OF



with Science's New Midget Miracle, the Presto Fire Extinguisher, says W. F. Wydalish, Ohio

Many others "cleaning up" — so can you! Amazing tiny new extinguisher ends fires fast as 2 seconds. Guaranteed 20 years! Sells for only \$3.98! Write for FREE Sales Kit. No obligation. Merlite Industries, Inc., Dept. 55, 201 East 16th Street, New York 3, N. Y. (If you want a regular Presto to use as a demonstrator send \$2.50. Money back if you wish.)



Wheels Wheels



Wheels Wheels

- 5" Disc Wheel 5/8" Tire 5/16" or 3/8" sleeve.....30c ea.
 - 6" Disc Wheel 5/8" Tire 5/16" or 3/8" sleeve.....35c ea.
 - 7" Disc Wheel 3/4" Tire 3/8" sleeve.....45c ea.
 - 8" Disc Wheel 1 1/4" Tire 1/2" sleeve.....70c ea.
 - 7" Disc Wheel 1" Tire 1/2" ball bearing.....80c ea.
 - 8" Disc Wheel 1 1/4" Tire 1/2" ball bearing.....\$1.00 ea.
 - 8" Disc Wheel 2" semi-pneum. T. 1/2" S.B.....\$1.35 ea.
 - 10" Disc Wheel 1.75 semi-pneum. T. 1/2" S.B.....\$1.50 ea.
 - 12" Disc Wheel 1.75 semi-pneum. T. 1/2" S.B.....\$1.85 ea.
- Above wheel prices includes hub cap. Plus Postage, C.O.D.'s accepted. AXLES—Sizes 5/16 in., 3/8 in., 1/2 in.—Cut to size—End holes drilled.

UNITED WHEEL STAMPING CO.
12131 S. PEGORIA STREET PM-5 CHICAGO 43, ILLINOIS

In Your Mind's Eye

The Secret of MENTAL CREATING

IF you just like to dream, read no further. There comes a time when your fancies *must be* brought into light—and stand the test of every-day, hard realities. Are you one of the thousands—perhaps millions—whose thoughts never get beyond the stage of *wistful wishing*? Do you often come to from a daydream with the sigh, "If only I could bring it about—*make it real?*"

All things begin with thought—it is what follows that may take your life out of the class of those who hope and dream. Thought energy, like anything else, can be dissipated—or it can be made to produce actual effects. *If you know how to place your thoughts* you can stimulate the creative processes within your mind—through them you can assemble things and conditions of your world into a happy life of accomplishment. *Mental creating* does not depend upon a magical process. It consists of *knowing how* to marshal your thoughts into a power that draws, compels and organizes your experiences into a worth-while design of living.

ACCEPT THIS *Free* BOOK

Let the Rosicrucians tell you how you may accomplish these things. The Rosicrucians (not a religious organization), a world-wide philosophical fraternity, have preserved for centuries the ancients' masterful knowledge of the functioning of the inner mind of man. They have taught men and women how to use this knowledge to *recreate their lives*. They offer you a free copy of the fascinating book, "The Mastery of Life." It tells how you may receive this information for study and use. Use coupon opposite.

The ROSICRUCIANS
(AMORC)

SAN JOSE

CALIFORNIA

SCRIBE: E. V. Z.
The Rosicrucians (AMORC),
San Jose, California.

Please send free copy of "The Mastery of Life,"
and I shall read it as directed.

Name.....

Address.....

City.....

INVENTORS

Your first step—if you consider your invention to be something of importance—is to have a search made of pertinent, prior U. S. patents. If our search report indicates probable patentability of your invention, you may apply for a patent which gives you the right to exclude others from making, using or selling your invention as claimed for a term of 17 years.

This firm is registered to practice before the U. S. Patent Office and is available to assist in the preparation of the necessary drawings, specification and claims.

Ask for a copy of our instructive booklet, "Patent Protection for Inventors" and our convenient "Evidence of Invention" form. No obligation.

VICTOR J. EVANS & Co. *Merlin M. Evans*
REGISTERED PATENT ATTORNEY
730-E MERLIN BUILDING, WASHINGTON 6, D. C.

INVENTORS

Before you make any effort to market your invention, you should take the first steps toward proceeding for patent protection.

I shall be pleased to furnish you with information relative to patent procedure, upon request from you, and this will be without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
934 Columbian Building Washington 1, D. C.

FREE BOOKLET TELLS YOU HOW

ART

Offers You a Profitable Career
—a wonderful hobby!



New Trial Plan proves that you can learn how to draw at home the easy WSA way. Commercial Art, Illustrating, Designing, Cartooning all in one course. Write for free book; read the interesting stories of opportunities for you in many Art fields. See how we prepare you in this well-paid field.

MAIL COUPON FOR FREE BOOK

WASHINGTON SCHOOL OF ART
Studio 125F, Washington 5, D. C.
Send Free Book, "Art for Pleasure & Profit."
No Salesman will call. PLEASE PRINT
Name.....Age.....
Street.....
City.....Zone.....State.....

I am interested in your new Trial Plan



THE MOST AMAZING OFFER IN USED TIRE HISTORY. EVERY PASSENGER TIRE UNCONDITIONALLY GUARANTEED plus TIRE INSURANCE FREE

10% OFF

Here's DOUBLE proof that we bear the loss if your passenger tire wears out within the guarantee period or is damaged in any way (except willfully). Don't take risks; we send FREE insurance certificate PLUS written unconditional guarantee with your order. ON ORDERS FOR TWO OR MORE TIRES

TRIPLE INSPECTED PASSENGER TIRES					
Unconditional		One Year Guarantee		plus Tire Insurance Free	
600-16	\$5.59	700-16	\$7.59	700-15	\$5.59
600-18 (6)	6.50	600-15	5.59	750-18	12.25
650-15	5.79	650-15	5.59	550-15	5.59
640-15	5.95	710-15	6.50	820-15	7.50
670-15	5.95	760-15	6.75	670-16	6.95
550-16	\$5.95	550-17	5.75	475-19	5.75
760-16	7.75				

MUD AND SNOW TIRES			
TWO YEAR WRITTEN GUARANTEE			
600-16	\$6.95	900-16	\$12.95
650-16	7.50	650-16 (6)	9.50
750-20 Reg.	\$12.50	Spec.	\$15.95
650-15	6.50		

EXTRA VALUE TRUCK TIRES					
ONE YEAR WRITTEN GUARANTEE					
600-20	\$10.75	750-20	\$14.50	825-20	\$21.50
650-20	11.75	32x6 (R)	11.75	900-20	19.50
700-20	12.50	32x6 (10)	12.50	1000-20	20.00
				750-20 (10)	18.00

Complete line of High Mileage Tires in stock. Write for price list for sizes not listed. Take off 10% on orders for two or more tires. Remember—every Passenger tire unconditionally guaranteed PLUS TIRE INSURANCE FREE. MAIL ORDERS PROMPTLY FILLED. Send check or money order with this ad. **THE SAFTYRE CO.** "FOR THAT SAFE TIRE" Dept. PM, 920 W. CARY ST., PO BOX 2254, RICHMOND, VA.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
201 Columbian Building, Washington 1, D. C.

PATENTS

C. A. SNOW & CO.

REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
428 SNOW BUILDING, WASHINGTON 1, D. C.

INVENTORS

Send for PATENT INFORMATION Book and INVENTOR'S RECORD without obligation. **GUSTAVE MILLER** 52-PM WARNER BUILDING WASHINGTON 4, D. C.

REGISTERED PATENT ATTORNEY
Patent Attorney & Advisor
U.S. NAVY DEPT. 1930-47
ASSOCIATE EXAMINER
U.S. PAT. OFF. 1922-1929
PATENT LAWYER

Say You Saw It in Popular Mechanics

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION, You should take steps to protect it by a U. S. Patent. Write me for "INVENTION RECORD" form

CARL MILLER

REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 35th FLOOR, 52A
NEW YORK CITY

NOW! LET INDIANAPOLIS SPEEDWAY CHAMPIONS SHOW YOU 106 EASY WAYS TO GET MORE SPEED & POWER!

Get 42-47 Miles

PER GALLON FROM YOUR CAR!

BURN WATER SAVE GAS!

(U. S. Agricultural Dept. Scientists say new water-alcohol combination can save you money!)

DRIVE 8,000 MILES WITHOUT OIL CHANGE! Zoom From 0 to 60 M.P.H. in 12 Seconds! Add 30 M.P.H. to Top Speed Of Your Car!

(Many results proved in official testing labs.)

ANY CAR! ANY MAKE! ANY YEAR!

NEWEST SPEED & POWER MANUAL!
No Experience Needed—Easy A-B-C Picture Instructions Show How To Mix, Burn Water & Gas For Amazing Speed & Economy—Resurface Cylinder Walls, Stretch Car Life Without Taking Engine Apart—Do Speed & Power Tuning With Screwdriver—Restyle '37-'47 Models to Expensive "Foreign" Look—Get Flash Starts, Top Performance, Hi Resale — Beat High Cost of Minor Repairs — SAVE HUNDREDS OF DOLLARS A YEAR!

No Guesswork — Everything You Have To Know!



Restyle, Repower Your Car! Make '37-'47 model look, run like '50!

Here for the first time is the only book of its kind ever published—a show-how, do-it-yourself **SPEED & POWER MANUAL** that shows you how to save 33 1/3% on gas bills—80% on oil bills—90% on repair bills—add \$300 to the resale value of your car! With sensational new discoveries of Automotive Engineers, Research Scientists and Indianapolis Mechanics, now it's easy to add new *surging* Power, Life, Mileage, Economy to your car! . . . whether it's a 15 year old jalopy or a shiny new '52 model — and **SAVE \$75 to \$300 THIS YEAR!**

Clear — Simple — Complete — Easy as A-B-C with "Show-How" Pictures



Secrets Of Wizard Mechanics! Start dead-battery car with bumper jack!

This new **SPEED & POWER MANUAL** is so complete, so easy to follow, so **FOOL-PROOF**, it's like having a master Indianapolis mechanic right at your elbow! Written in plain language with simple *show-how* drawings and cutaway diagrams anyone can understand! You not only read what to do, **YOU SEE HOW IT'S DONE!** It's so easy when you do it the **SPEED & POWER** way, and right from the start you'll learn the 30 to 40 quick tricks to get flash starts, lightning pickup, 15 more horsepower, amazing fuel economy; plus hundreds of tips like using simple gas and oil mixtures to add instant power and years of driving life to your car, *even if you've never looked under a hood before!*

NEWHOUSE AUTOMOTIVE INDUSTRIES Dept. SPD, 699 Madison Ave., New York 21, N. Y.

INDIANAPOLIS: Years ahead of the industry! *Balloon Tires* Introduced in Indianapolis . . . 1917! *Industry* adopted in 1923! *Self-Starter* Introduced in Indianapolis . . . 1916! *Industry* adopted in 1928! *Ethyl Gas* Introduced in Indianapolis . . . 1916! *1st sold Nationally* — 1925! *Other Indianapolis Firsts:* Rear view mirror — front wheel drive—super charge—4 wheel brakes—foolproof spark plugs—dismountable wheels—better springs—etc.

Not A Step Overlooked — For Beginner Or Expert



Learn Speed and Power Tuning! Simple adjustments for new pep.

1001 MONEY SAVING TRICKS of the master mechanics crammed into 1 great book! How to resurface cylinder walls in 10 minutes *without removing 1 part from your engine!* Stop power waste with 25¢ worth of graphite in your crankcase. How to double explosive power of your engine. How to fix-it-yourself; spot trouble, make emergency repairs with the tools in your car. Cut engine wear; stop summer overheating. Amazing *jiffy-car-polish* tricks. So complete it even has step-by-step sections showing how to rebuild, repower even junkyard Fords, Hudsons, etc., into sleek, 180 horsepower, 126 mph speedsters, with push-button doors, plastic tops, custom grillwork, exclusive redesigning with "pickup" parts, for foreign car features! It's the biggest, most complete, up-to-the-minute volume of automotive information ever published for the average car owner, yours **FREE FOR A WEEK** if you send **TODAY!**



SPEED and

\$1.98 ONLY

7 Day FREE Proof Money Back Guarantee

HERE'S PROOF! Ever notice how your car runs better on damp days? Engineers and Govt. testing bureaus now tell us what is actually taking place in moderate water injection, mixing with gas to give tremendous explosive power! (And test after test proves less engine wear and corrosion!) Now, easy picture directions show you how to take an ordinary Mason jar and a few inches of rubber hose, attach this simple, powerful "supercharger" to your carburetor, and suddenly discover *sensational new power!* . . . and gas savings up to 33 1/3%! This is only 1 of the 106 new motor miracles any car owner can do with new **SPEED & POWER MANUAL!**

WHAT EVERY CAR OWNER WANTS TO KNOW!

Partial Contents:

- Water-alcohol injection systems. How they work and why. How to make and install a Mason-jar water injector.
- 10 ways to save on gas.
- 8 ways to save on oil.
- Special fuels, carburetion.
- Better carburetor action.
- Hi-test vs. regular gas.
- Treated gas and oil.
- Air-fuel mixture adjustment.
- New type carburetors.
- Building your own dual manifold—dual carburetor.
- Using adjustable jet screws and air-flow needles.
- Supercharging your car.
- Speed and power tuning.
- Increasing top car speed.
- Increasing pickup on hills.
- Flash starts in icy weather.
- Re-working engines, ignition.
- Dual ignition systems.
- Easy ways to higher horsepower.
- Eliminating tappet noise.
- Eliminating carburetor flooding, fuel pump surge, motor cut-out, fuel waste.
- How to stimulate overheating.
- Engine lubrication magic: lifetime oil filters.
- 1 minute spark plug checking.
- Hi-compression conversions.
- Sport and model changes.
- Building your own roadster.
- Hard chroming tricks.
- Customizing, twizzling ideas.
- 10,000 extra tire miles.
- Touching up nicks, dents, for perfect blend and finish.
- Mounting tires on rear.
- Calli. style convertible tops.
- How to preserve car finish.
- 20 ways to increase resale \$.
- How to have automatic hill holder—6 forward speeds—no clutch shift, in present car.
- Emergency repairs made easy.
- Building a practical jet engine.
- 12 tips to A-1 car condition.

PLUS: Latest Information on Car, Replacement, Repair of:

- Fuel pumps—ignition, electrical systems—starter—battery—generator—body, chassis care—new silicone polishes—tires, brakes, cooling system—lubrication—oil filters—directional signals—accessories—performance boosters—lights, switches—shocks—ventilating system—transmission—rear end—engine—bearings—carburetor—speedometer cable—windshield wipers—steering wheel—etc.

. . . and much, much more!

SEND NO MONEY Mail Free Gift Coupon NOW

all 3 FREE (even if you return book)

1. *Speed and Special Equip. Catalog*, 36 pages, reg. 25¢ value. **PLUS:** Free membership National Discount Club saves you up to 45% on auto supplies and products.
2. *How To Obtain 150 Miles Per Gallon*, Amazing economy secret! Thousands of copies sold at \$1.
3. *Economy In Driving*. Can cut your bills to half! 48 pages, reg. 50¢ value.

ACT NOW

Special Offer Gives You 3 Valuable Handbooks FREE!

Send **TODAY** and get 3 extra handbooks described here (reg. \$1.75 value) yours **FREE** with **SPEED & POWER MANUAL**. Examine for 7 days. If not convinced book will pay for itself 10 times over in 1 week, save you \$75-\$300 in 1 year, return for money back, but keep 3 extra handbooks as **FREE GIFT!**

NEWHOUSE AUTOMOTIVE INDUSTRIES, DEPT. SPD 699 Madison Ave., New York 21, N. Y.

Gentlemen: Without obligation please rush me new **SPEED & POWER MANUAL** for **NO RISK** examination and trial. I agree to pay postman on arrival \$1.98 plus postage. If I am not satisfied, I may return in 7 days for full money back.

Also send me **ABSOLUTELY FREE**, the 3 handbooks described here (reg. \$1.75 value), plus my **FREE MEMBERSHIP** in National Discount Club. I understand these are mine **FREE**, whether or not I keep **SPEED & POWER MANUAL**.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

SAVE MORE! If you send \$1.98 with coupon, we pay all postage charges. Same money back guarantee.



Snappy Fish Fly Tie Clasp, Matching Cuff Links and Key Tag



Brand New Book Tells You How:
HOW to make these Yourself
HOW to sell at Big Profits
HOW to embed Real Flowers
HOW to create Smart Jewelry
HOW to buy at Wholesale
HOW to Make Money—At Home
HOW to Have Your Own Business
HOW to Use "The 3-Step Plan"



Hundreds of truly different articles which you can make profitably are described and illustrated in the new Castolite Creations Manual.

FREE—with this valuable book, our inspiring booklet "A Success Plan for You." Shows you how to earn and save more money and have a lot of fun doing it. Send 25c today to:

The CASTOLITE Co., Dept. E-1, Woodstock, Ill.

NIGHT DRIVERS For headlight Glare protection on those long trips at night, try the O. W. Glare Eliminator—the SAFE practical answer to the glare problem. In use by regular night drivers everywhere because—it blocks the glare—NOT THE DRIVER'S OWN VIEW. You take no risk because we guarantee satisfaction—or return the device for full refund, 30 day trial. Easily installed. \$8.75 Postpaid, or send for illustrated bulletin. O. W. AUTOMOTIVE DEVICES CO., 4413 Underwood St., Hyattsville, Md.

I'll Give You Bulldog Courage in 48 hours OR NO COST!

Are you timid? Bashful? Self-conscious? Are you afraid of people?—afraid of superiors? Give me 48 hours and I'll give you BULLDOG COURAGE. I'll make you bristle with fighting Determination or refund your money.



Thousands of men and women are being held back — made miserable — made unhappy. Why? Simply because of bashfulness — self-consciousness — fear of criticism — business worries — and dozens of other fears.

Yet fear is ABSOLUTELY UNNECESSARY. An amazing method has been discovered which banishes fear. No trouble! No inconvenience. No long waiting for results. This method is perfectly simple—perfectly natural—perfectly logical. It works almost instantly. Try it. You will be astonished! In just a few hours you may find yourself brimming over with splendid new courage—new daring—new self-confidence.

Only \$1 David V. Bush gives you his secrets of real he-man courage in his famous book called "Spunk". It is one of the most startling books ever written. You can't read it without a quickening of your pulse — without a surge of red-blooded courage. This book is declared to be the masterpiece of David V. Bush who has astounded thousands in America's greatest cities and shown thousands the way to health, prosperity and self-confidence. Write for this amazing book today. Send only \$1 in full payment. If you are not delighted, if your fears are not gone by the time you read this book, return the book within 5 days and your money will be instantly refunded.

INSPIRATIONAL PUBLISHING HOUSE, Dept. PM-5, Mehoopany, Pa.

Name _____
 Address _____
 City _____ Zone _____ State _____



START YOUR OWN ELECTRICAL APPLIANCE REPAIR BUSINESS

Repair electrical appliances of friends and neighbors. Service electrical equipment in factories, stores, etc. Work full or part time! New Shop Method home-training system. Rush name today for **FREE BOOK** and special form for getting Electronic Kit, Valuable Heating Element Kits, Advisory Service and Illustrated Instructions on new easy-payment plan. Pay later from **EARNINGS WHILE LEARNING.** Rush name today.

CHRISTY TRADES SCHOOL
 4432 N. Kedzie, Dept. D-603, Chicago 25



1952 EDITION

It's New! It's Different! Get world's largest Auto Accessory & Parts Catalog and save money. Over 50,000 items, including Hollywood Accessories, Hi-Speed Equipment, Re-built Engines, all parts & accessories for all cars & trucks. We have that Hard-To-Get part! Jam packed with bargains. Completely illustrated. (100 pages) Send 25c (refundable).

J. C. WHITNEY & CO., 1917-XP Archer Ave., Chicago 16, Ill.

WRITE 3 WORDS MAKE \$6.00 PROFIT—

—on 10-Second Demonstration to merchants. Write on glass with amazing Magic Crayon—Presto!—5 color advertising message takes fire, glows like brilliant Neon. Three sales daily bring \$18 profit. Rush name for **FREE** Sales Kit. **MAXILUME CO.**, 125 W. Hubbard, Dept. L-8-E, Chicago 10, Ill.

Write with Light—

Mustang **LIGHTWEIGHT \$370.00**
 (Fed. tax paid, at factory)
 9.5 hp. 4-cycle. 3-speed. Foot-shift. Over 70 miles per gal. Over 60 m.p.h. Write for free circular.
MUSTANG, Dept. PM
 635 W. Colorado, Glendale 4, Calif.

POLICE TYPE ANTENNA

For car radios. Long Distance Reception. Ideal for that out of town trip. Gets more stations. Mounts on rear of car. 96" open, collapses to 36". Chrome plated. Complete with lead-in wire. . . . \$5.45. Deluxe type 4 section 100" spring mounted base, triple chrome plated, extra long lead-in. . . \$6.45. Either type postpaid with remittance. Money back guarantee.

HUDSON RADIO CO.
 6004 PARK AVE. WEST NEW YORK, N. J.

200 RAZOR BLADES \$1.00
 BUY DIRECT AND SAVE! Double edge, Surgical Steel Rustless Chrome—Precision Ground. Over 5 Shaves Per Blade. Money back Guarantee. Send \$1 to **KLEEN SHAVE BLADES, Dept. P 5,** Box 55, Utopia Station, Flushing 66, New York

NU-WAY HEAVY DUTY CUTTING UNIT with Timken Roller Bearings

PRICE \$16.50
WHY PAY MORE

Build your own rotary type lawn or weed cutter. Take the hard work out of weed cutting. Build yourself an up-to-date weed and lawn mower with the Nu-Way heavy duty unit.

Write for Free Circular—We Supply Cutting Unit Complete
TRACTOR-LITE MFG. CO., Spirit Lake, Iowa

IMAGINE THEIR JOY when they found they could play this easy-as-ABC way!



LEARNED QUICKLY AT HOME
 "I didn't dream I could actually learn to play without a teacher. Now, when I play for people they hardly believe that I learned to play so well in so short a time."
 *H.C.S., Calif.



PLAYS AT DANCES
 "Your lessons have been most satisfactory. I can play all of the popular songs. I have earned money playing at dances."
 *E.N.J., New York.



PLAYS ON RADIO
 "I can't keep from telling you that I have a good position playing from K T H S, Hot Springs, Ark., every morning."
 *J.S., Okla.

What Instrument Would You Like to Play?

JUST name your instrument and we'll show you how you can learn to play it — quickly, easily, in spare time at home. Never mind if you don't know one note of music from another—don't worry about "special talent." And forget all you've ever heard about music being hard to learn.

The truth of the matter is that *thousands now play who never thought they could!* Yes, over 850,000 men and women everywhere have discovered this amazingly easy way to learn music at home. Now they are enjoying the thrilling satisfaction of playing the piano, violin, guitar, saxophone or other favorite instruments. Some of them are playing in orchestras and over the radio; others are teaching music, making money spare or full time. And thousands are having the time of their lives playing for their own enjoyment and the entertainment of their friends.

No tedious study and practice, no tiresome exercises. You learn to play by

Easy as A-B-C



playing — start right in with the melody of a simple tune! It takes only a few minutes a day; the cost is trifling. Does it sound too good to be true? Mail the coupon and get the **FREE PROOF!**

SEND FOR FREE PROOF

Fascinating illustrated booklet answers all your questions; free Print and Picture Sample shows how method works. If interested, just mail coupon. **U. S. School of Music, Studio B305, Port Washington, N. Y. (54th Successful Year.)**

*Actual pupil's names on request. Pictures by professional models.

FREE! Print and Picture Sample

U. S. School of Music, Studio B305, Port Washington, N. Y.

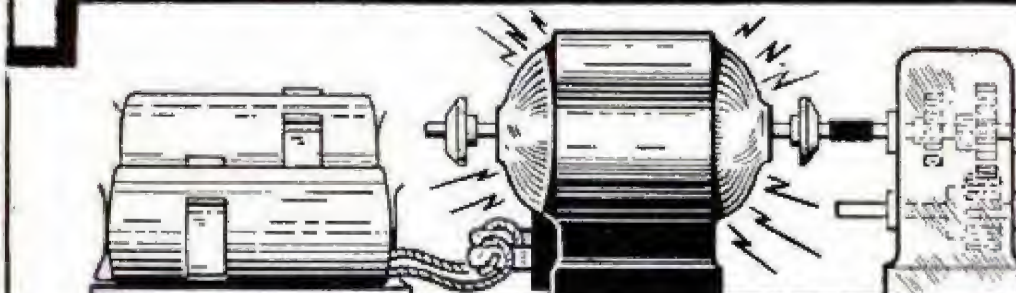
Send me Free Book and free Lesson-Sample. No salesman is to call upon me. I'm interested in playing (name instrument).....

I do I do not—have instrument now.

Name..... (please print)

Address.....

POWERFUL



MOTOR

It's Entirely SAFE! It's EDUCATIONAL! It's More FUN Than a Barrel of Monkeys!

Think of the fun you can have with this brand new all-purpose MIGHTY MIDGET electric motor! Think how many different ways you can hitch it up to run things — with gears, direct-drive, or with pulleys and "belt-drive" arrangements. There's no end to its uses! Be the first in your crowd to own this powerful new MIGHTY MIDGET Motor!

Look Fellows! Here's The Neatest, Strongest Little Real Electric Motor You've Ever Seen!

This amazing new miniature D.C. Electric Motor looks and runs just like a big one! Yet it's so tiny you can hold it in the palm of your hand. Slickest little power unit ever made to run your model boats, planes, cars, trucks, tractors, trains, drawbridges, cranes, turntables, fans—or whatever else you want to make GO with the flip of a switch! Motor and multi-ratio gear box and gears come to you—ready to purr with smooth power the minute you hook it up! Measures only 1x1x1¼ inches; weighs only an ounce. Turns up close to 7,000 r.p.m.'s!

BEVERSES instantly, too! Motor is in durable housing. Comes complete with batteries, transparent plastic gear box — **PLUS** ten extra gears — pulleys for working ratios — up to 80-to-1.

ONLY \$2.98

Mail coupon, NOW, without any money. Or (if coupon has already been clipped by someone else, before you) simply send \$2.98 as payment in full for motor and complete outfit sent **POSTPAID** as described above to: **Imperial Sales Co., 480 Lexington Ave., New York 17, N. Y.** Money back if you are not fully satisfied and return outfit within 10 days.

IMPERIAL SALES CO., Dept. 378
480 Lexington Ave., New York 17, N. Y.
 Rush me the "whole works" at once. I will pay postman only \$2.98, plus few cents postage, as payment in full.

NAME _____
 ADDRESS _____
 CITY _____ STATE _____

() **SAVE POSTAGE!** Check here if you are **ENCLOSING** \$2.98 as payment in full, in which case we will pay postage. Same money-back guarantee applies, of course!

**BETTER
THAN OWNING
A
GOLD MINE!**

**LIKE FINDING
PRECIOUS JEWELS
IN YOUR OWN BACKYARD**

How would YOU like to find exquisite jewels of incomparable beauty **RIGHT IN YOUR OWN BACK YARD!** Stones that are so beautiful you will feel like dashing right out to show them to the first person who comes along! Well, you don't have to go that far... you can make **ALL THE MOST ELEGANT AND MAGNIFICENT JEWELS YOU WISH... RIGHT AT HOME!** A new discovery, **GEMSTONE**, makes this possible! **YOU DON'T NEED ANY TOOLS OR MACHINERY!** The entire process is as easy as pouring water out of a glass! Yet, the **GEMSTONES** will leave you speechless with their endless beauty! **OUR GEMCRAFT OUTFIT IS BETTER THAN OWNING A GOLD-MINE!** We unconditionally guarantee... yes, read that line again... we unconditionally guarantee that **YOU** will be able to make beautiful and valuable gems with our **GEMCRAFT OUTFIT** or you may keep the outfit and it will cost you nothing! Stones alone are worth from \$1.00 to \$3.00 each and there is sufficient material in every outfit to make at least **100 beautiful stones!** Just think of the profit you can make with this new discovery... **GEMSTONE!** (**GEMSTONE IS NOT A PLASTIC!** It is an ENTIRELY NEW SUBSTANCE!)

MAKE \$100.00 A DAY

You can easily make \$100.00 worth of beautiful jewels in a single day using **GEMSTONE** materials and the **GEMCRAFT** process!
BIG GEMCRAFT OUTFIT ONLY.....\$4.95
Send today for your complete **GEMCRAFT OUTFIT** fully equipped as described. Explicit instructions in each outfit. Sent postpaid for only \$3.50. Or send 25c for our new catalog in which this and many other equally fascinating casting materials are described. Free book on **CASTING** sent along with our catalog.

PLASTICAST CO. (Dept. C)

P. O. Box 6737 (Write to P. O. Box 987
Chicago 80, Ill. nearest address) Palo Alto, Calif.



**20-MINUTE
INSTALLATION!**

**RAISE
SAGGING FLOORS
WITH
TEL-O-POST**

Eliminate floor sag—and prevent cracking walls, sticking doors, and open joints—with **TEL-O-POST**, the original adjustable steel jack post. Install it yourself under sagging beams in just 20 minutes. Then gradually adjust the built-in jack to eliminate sag.

Insist on **TEL-O-POST** for safety... supports loads to 22,000 pounds. Patented locking pin is tamper-proof. Use it in cellars, under porches, in garages, barns, etc.

Ask for **TEL-O-POST** by name at your building supply, lumber, or hardware dealer... or send coupon and \$10 check.



**BRAINARD STEEL DIVISION, Dept. C-5,
Griswold Street, Warren, Ohio**



- Send illustrated booklet on Tel-O-Post installation.
- My dealer does not stock. Enclosed is check for \$10 (\$15 west of Kansas City). Ship via express prepaid one No. 1 Tel-O-Post, adjustable from 5' to 8'4".

Name _____
Address _____
City _____ State _____

MONEY-BACK GUARANTEE IF NOT SATISFIED



**STOP BURNING OIL!
RESTORE COMPRESSION!**

Fisher's Compression SEAL

**ONLY
\$3.95
PPB**

Amazing Fisher's Compression SEAL will put new power & zip into your car. Because of friction, engine loss compression, become oil burners. A small amount of Fisher's Compression SEAL in each cylinder bore, expands 30 times; restores compression, stops piston slap, and reduces oil consumption accordingly. Old, tired engines may not need expensive overhauling.

SATISFACTION GUARANTEED

If after having driven 400 miles, you are not completely satisfied with the new performance and oil savings obtained from Fisher's Compression SEAL, return the used tube for a full refund. \$25,000 indemnity insurance policy in your assurance that it will not harm the finest engine. Only \$3.95 postpaid. Write for free folder. Finally installed, send cash, check or money order today. Dealer inquiries invited.

**ADVANCED ENGINEERING BOX 7013
Los Angeles 37, Calif. Dept. PM-5**

PHOTOGRAPHY



EARN BIG MONEY! PERSONAL ATTENDANCE TRAINING in News-Magazine-Fashion-Portrait-Advertising-Natural Color Photography. Splendid equipment, glamorous models. Or—our **COMPLETE HOME STUDY COURSE** provides you with a spare time short-cut to success.

Our 42nd year. Write immediately for **BIG FREE BOOK!**

**NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 49, 10 West 33 St., New York 1, N. Y.**

100 POWER... Telescope Lens Kit COMPLETE ONLY \$3.00

See The Wonders of The Sky.—Explore planets, island universes, new stars and million other phenomena. Lens kit consists of a 47 M.M. dia. 52 in. focal length ground and polished objective lens and a 100 power astronomical eyepiece lens. Simple to follow directions for assembling in one or two evenings. Mounting and tripod not included but easy to make from directions. Money back guarantee.

LEMAR SCIENTIFIC CORP., Dept. D5, 3412 W. Jackson Blvd., Chicago 24

GET UP TO 40% OFF! BUY IT WHOLESAL!

START A BUYING SERVICE at home, spare time. Get big-name merchandise for clients (and yourself) at up to 40% and more below the regular list price. Make fat commissions. Folks eagerly buy through you to get sizeable discounts. Send postcard for details.

AMERICAN BUYERS' SERVICE, 631-R Linden Ave., Buffalo 16, N.Y.

LEARN AT HOME UPHOLSTERING

EARN MONEY SPARE TIME—OR OPEN A SHOP!

Earn excellent profits spare time—open a shop—or get a top-pay job: Learn upholstery at home in months. Easy picture lessons show how. Valuable tools and materials to build ottoman included. Write for free booklet.

**COMMERCIAL TRADES INSTITUTE, Dept. U2-5
1400 Greenleaf Ave. Chicago 26, Illinois**



READ ABOUT TRAILERS BEFORE YOU BUY

TRAILER TOPICS MAGAZINE

Brings you the latest in Trailer Coaches—Equipment—Accessories—Trailer Trips—Trailer Parks and many other interesting monthly features at only — \$3.00 for 2 years.

(6 month trial subscription \$1.00)

Send your subscription to
**TRAILER TOPICS MAGAZINE, (Room 1578)
28 EAST JACKSON BLVD. CHICAGO 4, ILL.**

IMPROVE YOUR CAR'S APPEARANCE!

COWHIDE-LEOPARD



Only
\$2.98

REVERSIBLE AUTO SEAT COVERS

Can be used on both Sides — Printed Heavy Duty plastic with COWHIDE design on one side and LEOPARD SKIN on the other.

- GUARANTEED TO FIT
 - Reinforced Seams and tie back
 - Will not crack or Peel—withstands winter cold
 - Waterproof and stainproof, cleans with damp cloth
 - Extra strength elastic throughout
 - AN AMAZING VALUE at 2.98
 - SMART LOOKING
- Front or rear seat only \$2.98 or complete set \$5.00. Specify type A or B.

KROMWHEELS FOR THAT CUSTOM TOUCH



YOU CAN ADD THAT DISTINCTIVE TOUCH

Add a set of Shimmery STAINLESS STEEL discs to your car's wheels. Get that expensive look to your car regardless of its age. Kromwheels will fit all makes

\$9.98
PER SET

(Also available in White Wall Model. Per Set \$5.95)
and models of cars using a 15 inch or 16 inch tire. Specify make and year of your car when ordering.

Develop Hidden Earning Power

STUDY LAW

at home! LL.B. Degree

Qualify yourself in spare time for advancement, greater earnings, business success. Now, more than ever, legal ability is in demand! Easy-to-understand step-by-step lessons and text material furnished — invaluable for permanent reference. Over 40 years expert instruction. 114,000 students enrolled. Easy payments. Find out now, at no cost, how study of law can help you. Write today for FREE Book "Law and Executive Guidance."

AMERICAN EXTENSION SCHOOL OF LAW

Dept. PM-50, 646 N. Michigan Ave., Chicago, Ill.

PLEASE
SEND ME



for the
time checked.

I am enclosing . . .

1 year \$3.50
2 years \$6.00

name _____
address _____
city _____ zone _____ state _____ C-52

Hand this order to your newsdealer or send it to

POPULAR MECHANICS
200 East Ontario St. Chicago 11, Ill.

KROM-VENTS FOR EXTRA PROTECTION



ADD THIS DISTINCTIVE EXTRA TO YOUR AUTOMOBILE

Kromvents improve your car's appearance immediately. They add the luxury-look and do so much more too! Made of Jewelglow chromed surfaces on heavy gauge metal to match the chrome on the car.

KROMVENTS WILL: • Permit windows to open up to 3" in rain or snow. • Keep rain, snow and sleet out of the car. • Eliminates windshield fogging in inclement weather. • Protect your upholstery from sun and rain. • Cut down sun glare and permit ventilation of car.

Made to fit perfectly! Install in minutes. Will fit all cars. When ordering give make, model and year of your car. 2-door sets \$7.50 or 4-door sets \$12.50. Hardtop Models \$17.50 per set.

PORTABLE GARAGE

• Goes wherever your car goes • Folds compactly
• Keeps rain, snow, dust, salt air, sun or sleet away • Will withstand extreme temperature without cracking • Protects your car's finish • Perfect for storage of Cars, Furniture, Machinery Equipment • Durable constructed of clear transparent vinyl plastic that is long wearing and tough • Nylon threads and grommets for extra security • Spring-lite elasticized bottom, holds securely in all kinds of weather • Fits all makes and models.



Flexon—Awarded Good Housekeeping Seal

\$10.95
(EXTRA HEAVY GAUGE)

\$8.95
(HEAVY GAUGE)

Rush This Special 10-Day Trial Coupon

MARDO SALES CORP., DEPT. 434,
480 Lexington Ave., New York 17, N. Y.
Please send me the articles I have marked off on 10-DAY MONEY BACK GUARANTEE. If I am not satisfied with any of these items I may return them for complete refund.

PORTABLE GARAGE —
 Extra Heavy Gauge \$10.95 Heavy Gauge 8.95
 REVERSIBLE SEAT COVERS —
 Split or Solid \$2.98 Both Front and Back \$5.00
 KROMVENTS —
 2 Door \$7.50 4 Door \$12.50 Hardtops \$17.50
 KROMWHEELS — Stainless Steel \$9.98 White Walls \$5.95

Name _____
Address _____
City _____ Zone _____ State _____
 I enclose Check or Money Order. You Pay Postage.
 Send C.O.D. I will pay postman plus delivery charges.

BLACK EBONY SEAT COVERS

SWEEP TO SENSATIONAL NATIONAL POPULARITY



Salesmen jamming pockets with \$1000 bills
TAKING ORDERS FOR KEY EXPERTLY TAILORED AUTO SEAT COVERS

9 STYLES BIG SEASON NOW STARTING

You've seen the huge color advertisements in Saturday Evening Post on the new seat cover sensation—miracle SARAN in the beautiful new Black Ebony pattern, SARAN—the plastic, woven like cloth, that has the color permanently "locked" right into each thread! Car owners everywhere are demanding Black Ebony Saran Seat Covers. Now you can serve that eager demand at a fraction of the cost the customers expect to pay! No wonder salesmen are making money hand over fist with this sensational new Key line. **Make big money daily.** Take orders from car owners everywhere. Beat all competition with covers cut to accurate patterns like the finest suit of clothes...Slick, smooth, wrinkle-free fit adds an accent of elegance to any car...just like the original upholstery job!

Rush Name for FREE Outfit

Give MAKE, YEAR and MODEL of YOUR CAR
Anyone working full or spare time can realize big money in this business. No need to search for prospects. Every car owner is one. Be the first to cash in... Make year around STEADY PROFITS. Don't put it off—get your Free Selling Kit at once for some real money. *Actual seat covers given FREE to producers for OWN USE!* Write for full details!

KEY PRODUCTS CORP., Dept. 45
800 N. CLARK ST., CHICAGO 10, ILLINOIS

ELMER'S a Mr. Fix-it!



It's amazing what this wonderful white glue can do on: furniture, wood, paper, fabric, pottery, leather, linoleum, etc. ELMER'S Glue-All is white magic for strong, invisible gluing. Dries in a jiffy! Wonderful for kids because it washes off hands and clothing instantly. Non-staining—and so easy and pleasant to work with. Get a trial-size bottle of ELMER'S Glue-All today—another Borden's product that belongs in your home.

If it's Borden's, it's GOT to be good



ELMER'S
GLUE-ALL



Borden's



CUT BUILDING COSTS 2/3! Make Your Own Concrete BLOCKS and BRICKS To Use or Sell

New superior moulds make absolutely square, true, easy-to-lay blocks which will pass any building code. Production is fast... easy. One durable \$30 machine will make four 5"x8"x12" blocks per minute—1,000 a day. Pays for itself in one day! Sell blocks for big profit... or save 2/3 building cost for yourself. POST CARD BRINGS FREE FOLDER.

ECONOMY MFG. CO.
DEPT. P STONE MOUNTAIN, GA.

GROW MINIATURE TREES

FOR PROFIT & PLEASURE

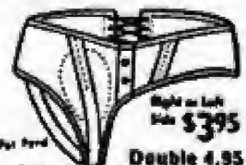


Fabulous Money—Real Fun! Grow genuine live dwarf (Ming) trees. A terrific new business and hobby. Astounding details Free. Write — DWARF TREES; Dept. 28 P. O. Box 355, Briggs Station Los Angeles 48, Calif.

RUPTURE-EASER

FOR MEN, WOMEN AND CHILDREN

A strong, form fitting, washable support. Back lacing adjustable. Snaps up in front. Adjustable leg strap. Soft, flat groin pad. No steel or leather bands. Unexcelled for comfort. Also used as after-operation support. Give measure around the lowest part of the abdomen. State right or left side or double. We pay postage except on COD's. PIPER BRACE CO., 811 Wyandotte Dept. PM-52



Right or Left Size \$3.95
Double 4.95

Kansas City 6, Mo.

WATCHMAKING

Learn at home • FREE sample lesson

CHICAGO SCHOOL OF WATCHMAKING
1608 N. Milwaukee Avenue Dept. 152 Chicago 47, Ill.

Home Movies WESTERN THRILLERS in 8mm & 16mm

JOHN WAYNE
RANDOLPH SCOTT
BUSTER CRABBE
GAIL PATRICK
RUSSELL HAYDEN

- Heritage of the Desert
- Knights of the Range
- Drift Fence
- Farfrom River
- Hell Town
- To the Last Man

8mm: 50' 1.75, 200' 4.25
16mm: 100' 2.75, 400' 8.75, sd 17.50

HOLLYWOOD FILM ENTERPRISES

4060 Sunset Blvd.
Hollywood 28, Calif.



Learn BAKING At Home

Baking is one of America's high industries in wages. Nearly depression-proof. Thorough basic home course lays sound foundation. If you have aptitude, write for FREE BOOKLET. "Opportunities in Commercial Baking." NATIONAL BAKING SCHOOL Dept. 1385 835 Diversey Pkwy. Chicago 14



SO BADLY NEEDED—

—that Our Men are NOW SELLING—

5 to 10 in One Home—
10 to 80 in One Office—
50 to 432 in a Factory.

Men Actually Making \$40 to \$60 A DAY! Right NOW!

Read the facts in the panel at the right. Then you'll understand how Riggs could make \$187.26 in three hours—how Jackman got an order for 432 with a five-minute demonstration—why an office girl in spare time could sell 87 in just two calls in one building.

No more tangled phone cords, appliance cords, extension cords on power tools. No more danger of fires from short circuits in broken, twisted wires. No more knocking papers all over the desk every time the phone is used. So badly needed that there are millions and millions waiting for just one demonstration to give orders for five, fifty, or a hundred.

There's never been anything like it for fast money for any kind of salesmen. Companies

like Std. Oil, Pure Oil, Bank of America buy in large quantities. Cities buy. States buy. Hospitals buy. Everyone buys. And our salesmen are coinng cash, hand over fist.

GET TWO SAMPLES QUICK!

Two models fit all needs. Retail at 95c each. You make as high as 120% profit mark-up on your cost. Rush name and a dollar bill. We'll send two Collettes—one of each model, as samples. Money back if you return them in ten days.

The stampede is on. Salesmen and crew managers are throwing other lines overboard. Get in now on the biggest "pay-off" in years.

MAXILUME CO., 125 W. Hubbard Street, Dept. T-8-E, Chicago 10, Ill.

PAT. NO.
1,790,666



A simple little piece of coiled piano wire takes the kinks out of all electric cords—Recoils the wire in a neat stack each time it is used—on phones, fans, irons, vacuums, adding machines, power tools. Two minute demonstration sells 8 out of 10 prospects—and almost every prospect buys from 3 to 100. Re-orders will swamp you. You have to see it to understand. Send for two samples TODAY.

GREATEST SAVING EVER OFFERED!
U. S. GOV'T SURPLUS

"BARGAIN BOOK"

SAVE ON WINTER NEEDS!

It's loaded with bargains in genuine Gov't Surplus for farm-home-industry. Save up to 85% on clothing, hardware, sporting goods, etc. The "Book of the Year". Send 10c for yours today.

500 BARGAINS
• FARMS • SPORTS
• HOME • SHOP

MAIL TODAY Only **10c**

FISLER SALES CO.
723 WALNUT ST., DESK M-5, KANSAS CITY, MO.

BRAND NEW

30 DAY FREE TRIAL

High Power BINOCULARS

Finest Precision Optics
Featherlight
Money Back Guarantee
Easy Pay Plan
Leather Case Includ.

Free! Catalog & Book
"How to Select Binoculars"
Dealer Inquiries Invited

Bushnell Bldg., Dept. M45
Pasadena 1, Calif.

BUSHNELL Binoculars

33 MODELS
\$14.95 up

FREE GUIDE "How to Select Binoculars"

NAME _____ CITY _____
ADDRESS _____ STATE _____

STUDY TO BE A DOCTOR

of Psychology or Metaphysics

Obtain a Ps.D., Ms.D., D.D., or Ph.D. degree. Be a Teacher, Lecturer or Accredited Practitioner. Teach others how to achieve Health, Happiness and Contentment. Chartered by State. Write for FREE book telling how.

THE NEOTARIAN COLLEGE OF PHILOSOPHY
Desk B, Pickwick Building Kansas City 6, Missouri

JUST OUT—1952 EDITION

It's new... it's different... it's more than a CATALOG... Tandy's new 64-page Instruction Book and Leathercraft Catalog. How to make 50 items, including lacing braiding, plaiting and beading. 20,000 items completely illustrated, jam-packed with BARGAINS!

FREE WRITE TODAY

TANDY LEATHER COMPANY
P. O. Box 791-80 Fort Worth, Texas

MAY 1952

I GAINED 53 LBS. OF SHAPELY POWER-PACKED MUSCLES

says Roger Hirsch, N. Y.

NOW **2** **ME'S** **is YOU?** **BEFORE**

"That 112 lb.—6 ft. spindle-armed Sissy at right was ME a few short weeks ago", says Roger Hirsch. Look at him NOW! I gave him 53 lbs. of MIGHTY MUSCLES, added 6 1/2 inches to his CHEST, 3 inches to each ARM! They don't call him SKINNY any more!

NOT I don't care how skinny or flabby you are. All I want is 10 minutes a day in your home to make you over by the same method I turned myself from a wreck into a Champion of Champions. You'll become an ALL-ROUND, ALL-AMERICAN, HE-MAN, A WINNER in everything you tackle—or my training won't cost you one cent.

SEND ME ONLY **10c** for all **5** PICTURE-PACKED HE-MAN BUILDING Courses and also get

Both FREE 1. PHOTO BOOK OF STRONG MEN
2. A MUSCLE METER

JOWETT INSTITUTE, Dept. PM-25
230 Fifth Ave., New York 1, N. Y.

Dear George: I enclose 10c for which please send me an trial kit 5 picture-packed HE-MAN Building Courses, FREE Photo Book, and Muscle Meter.

NAME _____ AGE _____
(Please print plainly. Include Zone Number)

ADDRESS _____ No C.O.D.'s

CITY _____ ZONE _____ STATE _____

"Win This 15" Silver Trophy as I did." *By Original*



Trained Technicians...

ARE CLEARED TO COME IN!

Special skills expertly maintain the global operations of our expanding United States Air Force. It is special skills of trained craftsmen, behind the flying skills, that keep our modern air power aloft to defend our nation.

Men with training as former specialists in any Service . . . or non-veterans with special technical talents . . . are needed *now* to support our ever-growing air might. Radio, radar and other communications specialists, weather, armament, automotive maintenance, medical technicians and many technical skills are urgently needed . . . now . . . today!

For your specialized "know-how," your

Air Force offers greater opportunities for advancement, security and a rewarding sense of an important job well done.

Here, briefly is the story: If qualified, you can enter the Air Force in an attractive grade, according to your present ability. The Air Force will tell you exactly what your initial rank and pay grade will be before you join-up. Veterans, if qualified, enter in their old grade or better and will skip basic training and be assigned initially to a nearby Air Force Base.

For the rest of the story in detail, consult your local U. S. Army-U. S. Air Force Recruiting Station immediately, or *mail coupon today!*

MAIL COUPON TODAY for Full Information



AIRMAN PROCUREMENT
 Headquarters, U. S. Air Force
 Washington 25, D. C.

Please send me details about U. S. Air Force specialists.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

SPECIALTY _____

**WORLD'S
BEST
WANT AD
MEDIUM**

CLASSIFIED Advertisements



Advertisements in this section 85 cents per word, each insertion, minimum 10 words, payable in advance.

To be inserted under proper classification, copy must be in our office the

20th of the second month preceding date of issue

F. W. Johnson, Manager, Classified Advertising

Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, Illinois

YOU'LL PROFIT

By reading and answering the classified ads in this section. Hundreds of opportunities for you to make and save money

AUTOMOBILES, MIDGET CARS

MOTORISTS! Amazing speed, performance, mileage increase (up to 20%) for \$2.00. Revolutionary new development, complete, guaranteed. Order Speedtune today. Make, model. Johnson, Box 657, Rio Grande City, Texas.

CROSLY Car Owner's Club, one of the most exclusive auto clubs in the U.S.A. Members coast to coast. Actual owner's opinions and experiences revealed through club bulletin. Free accessories offered. Eye-catching windshield decal, identification card and photo-stamps of your own model Crosley. Write: Crosley Car Owner's Club, 304 North Poplar, Charlotte, N. C.

SERVICYCLE \$15, Midget car \$10, Dart motor scooter \$17, less engines; two cylinder opposed 5 horsepower engine \$20, others \$7.50 up (mailorder only). Send 25c for catalogue number 47, listing these and hundreds of other bargains in midget cars, motor scooters, outboard motors, homebuilders parts, plans, etc. (35c by first class mail). Midget Motors Directory, Athens, Ohio.

MOTORIST! Save dollars! Clix tire saver warns you tire is low, prevents blow-outs, ruined tires, saves lives. Guaranteed, \$2.00. Johnson, Box 657, Rio Grande City, Texas.

STANLEY Steamers, Doble data, parts. Circulars, three dimes. Box 1073, Newark, California.

AUTOMOBILE Literature—Old, new, foreign—By non-profit organization. Data books, glossy photos, engineering papers; free motor magazines. Contact auto nuts everywhere. Write today; get on free mailing list. Auto Maniacs, Stockbridge, Mich.

POWERCAR Junior—Real children's auto! See details under "Motorcycles-Bicycles."

HOW To soup-up your car. Hot rod handbook plus equipment catalog. 25c postpaid. Alquist Engineering, Milford 56P, Pennsylvania.

"WATER Injection" Spark boosting. Economy methods. Neher Industries, La Verne, California.

SPEED Equipment—Save up to 50%. Hollywood mufflers \$4.95, dual mufflers \$18.95, header kits \$12.95, cut outs \$6.95, dual intake manifolds \$12.95, chrome stacks \$1.25, racing cams \$29, hi-compression heads \$18.95, water injectors \$5.95, customizing kits \$1.98, chrome accessories at discounts! Catalog plus hot rod handbook 25c. Alquist Engineering, Milford 54P, Penna. Dealers wanted.

SAVE On repairs! Send \$1.00 for "The Automobile Owners' Guide"! Explains in simple, non-technical language the working mechanisms of your car—how each section works, how to give it the best care and what to look for in case of breakdown. Jaher Publishers, Dept. P, 620 East 178 St., New York 51, N. Y.

BUY Racing heads, dual manifolds. Hot coils, etc., without money. Information free. Newhouse Automotive Industries, Los Angeles 22.

FROM Speedway to roadway! Track-proved hi-speed heads and manifolds for your passenger car! No special tools needed! Increase horsepower 30%! Astounding getaway! Free illustrated catalog. (Dealers wanted.) Speedsport, 4856-D Milwaukee, Chicago 30.

LATEST 1952 Edition! Just out—100 new pages! Get world's largest auto accessory and parts catalog and save money. Over 50,000 items, including Hollywood accessories, hi-speed equipment, rebuilt engines, all parts and accessories for all cars and trucks. We have that hard-to-get part! Jam packed with bargains. Completely illustrated. Send 25c (refundable). J. C. Whitney, 1919 Archer, Chicago 16.

SAVE—California custom accessories headquarters. Buy direct from original designers. Chrome dash panels, electric push button door-trunk conversions, fender skirts, dual mufflers, lowering kits, speed-dress up equipment. 40 page catalog, hundreds of photos—25c. Eastern Auto, 3319A South Grand, Los Angeles 7, Calif.

AUTO SUPPLIES AND EQUIPMENT

CHEVROLET Owners: Stop tappet noise with Kaye Tappet Silencers. Quality product. Easy to install. Money-back guarantee. Complete set \$5.95 postpaid. Kaye Products, 1321B So. Layton Blvd., Milwaukee, Wis.

YES, it puts bearings on the pistons. Lachapelle's patented motor treatment. "It works." \$3.00 delivered. Circular on request. Write warehouse and agents distributor Joe Dillon, Box 323, Bridgeport, Ohio.

FLASHLIGHT Users. Hours more bright light from your batteries! Recharge in car free without removing from flashlight. Simply, conveniently. Guaranteed, illustrated instructions \$1.00. Product Designers, Henniker 15, N. H.

DESTRUCTIVE Automobile fires, horn shorts, etc., stopped by Zak Auto Fireman! This safety device quickly disconnects battery. \$1.00 postpaid. Money back guarantee. Free literature, Park Sales, P.O. Box 73, Forest Park, Illinois.

ELECTRIC Windshield wiper. Motors repaired or exchanged for all Chrysler built cars. Factory to you prices. Windshield Wiper Service Co., 911 W. 69th St., Chicago.

ELECTROPLATE Metals, non-metals. Portable Tyco electroplater \$5.95. Free booklet. Tyco, Box 13231-BE, Houston 19, Texas.

LACHAPELLE'S Treatment (patented). Puts bearings on the pistons. Your dealer or postpaid \$3.00. Ferns Products, 8120-B Walnut Dr., Los Angeles 1, Calif. (Data on request.) Cuba, Luis Izaguirre, San Carlos 178, Cienfuegos.

CONVERTIBLE Tops raised automatically by rain. Like Sabre. Construction plans \$1; details, stamp. Specialcom, Box 170, Urbana, Illinois.

1952 SUPERIGNITIONITER—Starting, pep, mileage \$4.50, 200#s barbelts—\$28.00. EG., Elmsford, N. Y.

FREE Trial, Gane Airflow Needles. Send car data. Neher, La Verne, Calif.

AMAZING—Anti-static cloth. Eliminates annoying shocks from plastic seat covers. Retards dust collection inside radios, TV, on furniture. Many uses. \$1.00 postpaid. Chaney, P.O. Box 92, Collegeville, Penna.

STOP Wasting power and gas with "Carb-Out" the modern 15 minute way to remove motor damaging carbon. One pint \$2.00 postpaid. Freed Automotive Research, 322 Whitton St., Jersey City, N. J.

MOTORIST Save gasoline by Vacuumating overrich mixtures. Fits all cars. For free particulars write Vacuumatic, Dept. 1804, Wauwatosa, Wis.

"SCUM-Oil" a cleaning product that removes scum, roadfilm and bugs, with water, that normally needs abrasive compounds. Consumer package (\$2.00) gives several treatments. Use on any car. Chrome rusty? Clean with special sponge and water. Usable many times. Sponge \$1.00. Box 952, Lake Forest, Illinois.

PRECISION Pressure, vacuum, ignition instrument, tunes engines to deliver dynamic performance. \$3.95 complete. Graco Engineering, Box 265, Shelton, Conn.

BRAKE Floater for Chevrolet, Ford and Mercury cars insure more powerful brakes, soft pedal, cure squeal. Write Super Brake-Floater Company, 4022 West Lake Street, Chicago 24.

ARROW Auto Parts Company. Truck parts our specialty. 1600 Washington Avenue North, Minneapolis 11, Minnesota.

SIRENS. Air horns! Bermuda bells. Free accessory catalog. McCanna Company, 148-PM East 40th, New York 16.

GM71 Discarded injector parts wanted. Bares, 7120 Carnegie, Cleveland, Ohio.

GOVERNORS And butterflies for auto or any gasoline driven engine. Candee-Smith, P.O. Box 612, Riverside, Calif.

AUTO Radios at wholesale. List free. Regent, 801 W. Erie, Philadelphia.

MOTORISTS Are reporting three to five more miles per gallon. Guaranteed, gasoline vaporizer, increases power; easier starting. \$3.50. Turb-O-Vane, Stockton, California.

NEVER Change your oil! Full details free. Thousands of users. New oil filter. Dept. TI, Henderize, Inc., 5667 Freeport Blvd., Sacramento, California.

HYDRAULIC Jack repair kits. Repair your own. Send for prices. Jack Parts Company, 2000 South Claiborne, New Orleans, La.

BRUSH Plating outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Ave. J., Decatur, Ill.

LIGHT Your Powerglide dial. Free information. Gaiser, Box 25, Kokomo, Ind.

AUTO Parts and accessories. Briggs Automotive Engineering of Chicago, P.O.B. 3454 Merchandise Mart, Chicago 54, Ill.

HOW To buy speed equipment without money. No selling. Information free. Newhouse Automotive Industries, Los Angeles 22.

NEW And used guaranteed parts for civilian and army cars and trucks. Largest stock in America. Mail orders. Pioneer Auto Wrecking Co., 734 W. 13th Ave., Denver, Colorado.

AUTO TRAILERS

BUILD Your own trailer! Plans for all kinds. Illustrated catalog 10c. Jim Dandy, 125-M, Wausau, Wisconsin.

BUILD Streamlined telescoping house trailer. Not canvas. Free information and pictures. Thomas Comstock, 585, Parsons, Kansas.

MOTORCYCLES, BICYCLES, MOTORSCOOTERS AND SUPPLIES

HARLEY-Davidson parts and repair manuals for all models. Authorized dealer, Philadelphia Harley-Davidson Co., 857 North Broad Street, Philadelphia 23, Penna.

POWERCAR Junior—Real children's electric auto. Plenty of power for hills, towing wagons, etc. Catalog free. Mystic River Sales, Dept. P5, Mystic, Connecticut.

HARLEY-Davidson 1930 to 1940 complete stock of parts. New 45 surplus motors complete. Lauby Cycle Service, Marshfield, Wisconsin.

BUILD Own motorscooter. Factory made frames, forks, wheels, sprockets, tires, engine parts. American Moto-Scout Co., 3842-44 Lawrence, Chicago 25, Ill.

PARTS, Pistons, new, used, cheap, Harley, Indian, Henderson. List 10c. Ballak, 811 N. 9th, St. Louis 1, Missouri.

SPEEDMASTER Bicycle speedometer. 50 m.p.h. readings. \$1.00. Osgood, 1320 Prospect, New York 59.

WHIZZER Motor \$5; Cushman motor-scooter \$15; Indian motorcycle \$30; Engines \$3 up; motorbike frame \$3. Rush 25c (35c first class mail) for catalog #951 listing many other amazing bargains in motors, midget cars, motorscooters, motorbikes, etc. Associated, Box 1784-CS, Toledo, Ohio.

WRECKING 25 Cushman scooters, 1944-1951 models. Motors, transmissions, frames, wheels, hubs, rear covers, etc. All in running condition when traded on new Cushman. Write for free price list. Cushman Motor Scooter Co., 3812 W. 6th, Amarillo, Texas.

SAVE Money! Genuine black horsehide motorcycle jackets—direct from factory. \$35.00 value! Only \$24.95 postpaid. Satisfaction guaranteed. Send size. American Outerwear Mfg. Co., Box 37, Garfield, N.J.

RECONDITIONED Motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Past service. Indian Motorcycle Sales, Kansas City 1, Mo.

HARLEY-Davidsons—All models and prices. Genuine late and old model supplies. Expert service. Send 25c for bulletin. Knuth's, 1753 Muskego, Milwaukee, Wis.

GOOD Whizzer \$20; motorscooter (twist grips) \$22.50; midget car \$15; Shaw bicycle motor \$15. Send 25c (35c first class mail) for catalog #20 jammed with sensational bargains in wheels, motors, clutches, motorscooters, midget cars, motorettes, motorbikes, etc. Gail, 538 Erie, Toledo, Ohio.

U. S. Govt. surplus "45" Harley Davidson motors, complete with carburetor and generator, in running condition—\$69.50 f.o.b. Chicago. 25% deposit with order. Parts and accessory catalog 25c. Triangle, 2157 Harrison, Chicago.

MOTORCYCLE Magazine—Worldwide coverage. Yearly subscription \$2.00. Sample 20c. Motorcycle News, 5424-A Sawyer, Chicago 25.

REBUILT Gasoline engines \$17.00 to \$37.00. Cauffiel Motor Industries, Temperance, Michigan.

AVIATION

LEARN To fly with the Aviation Cadets. Get paid while learning. Flying Opportunities, 25c. Cramwell Books, PM-7, Adams, Mass.

AVIATION Quiz—All about aviation in 1001 questions and answers. Price one dollar. Aero Data, Box 905, Sea Cliff, Long Island, N. Y.

LIGHTPLANE Circular, illustrated, 26c. Craftsman Books, Box 1153, Milwaukee 1, Wis.

PROPELLERS: For snowsleds, boats. Literature. Standard Aircraft, Box 387, Ft. Worth, Texas.

BATTERIES, GENERATORS

GENERATOR, 1000 Watt, 110 volt, a.c. built from 12 volt Dodge generator. Volt regulator. Constant voltage, variable speed. Instructions guaranteed. \$3.00. Allen's Service, 1432 Del Valle Station, Los Angeles 15, Calif.

EDISON Non-acid storage batteries. Amazing long life. Any voltage. 37 to 600 ampere hour sizes. Lighting plants, generators, motors. Literature. Hawley Smith Co., Croton Falls 1, N. Y.

ELECTRICAL SUPPLIES

MAGNETOS—Fairbanks-Morse FMJ single cylinder flange mount \$9.50. Zinke, Dobbs Ferry, New York.

BE Independent, be secure, have your own profitable business—Earn \$20.00 and more a day making beautiful, fast-selling lamps at home. No equipment needed. Illustrated course teaches you quickly. Course, parts catalog, wholesale price list—only \$2. Gearon Co., Dept. 200-B5, 27 S. Desplaines, Chicago 6, Ill.

FREE—War surplus catalog. Bargains galore. Welders, motors, generators, hydraulics, pumps, kits for assembling your own, other items. Save. LeJay Company, Minneapolis, Minnesota.

BIG Profits rebuilding automobile generators. Introductory manual \$1. Modern, Box 4704, Kansas City, Mo.

ELECTRIC Pencil—Writes, engraves all metals. \$2.95. Reb Industries, 265-DAC, Elmhurst, Illinois.

TELEPHONES—Telephone wire. Solve communication problems with army field telephones. Anyone can install, operate. Free folder. Loris Sales, Box 1396-B, Sacramento, Calif.

LAMPS—Had trouble finding repair parts? Your search is ended. 25c brings 64 page illustrated catalog containing wiring charts. Gyro Lamps, 5402P Clark, Chicago 40.

LAMP Supplies—Wholesale. Any amounts. Prompt shipment on all parts for repairing and building lamps. Illustrated catalog 15c. Brown Lamp Co., Box 501, Wellston Sta., St. Louis 12, Missouri.

A.C. Watthour meters \$5.00. Miller, 1011 W. 16th St., Davenport, Iowa.

ASTONISHING! Plastic magnets, Pair 25c. 2442 Miller Road, Flint, Michigan.

ELECTRIC Pencil: Engraves all metals \$1.50. Beyer Mfg., 10511-H Springfield, Chicago 43.

WELDING, SOLDERING, PLATING

ELECTRO Plating equipment—New and used. Complete assemblies. All sizes for all types of plating. Baby shoe metalizing sets. Mounts, supplies, instructions. Free catalog. Hollywood Bronze Supply, Dept. 2, 1624 E. First Street, Los Angeles 33, Calif.

ACETYLENE Welding outfits. New \$49.00; used \$29.00; arcwelders \$49.00. Eagle Welding, Dept. PM, 5085 Broadway, Chicago 40, Illinois.

WELDERS Make your own welding flux. Details free. Fenn, B129-ME, Embarrass, Wisconsin.

MACHINERY, TOOLS, SUPPLIES

ANYONE Can use slide rules. 12" precision engraved \$6.75, with instructions. Free catalog. Bartro, 11A East Peoria, Pasadena, Calif.

POWER Tools, equipment, wholesale prices. Free bulletin. Homecrafters Cooperative, Grand Rapids 6, Michigan.

SIX Piece tool set postpaid \$1.00. Robe Factory, 1716 South Michigan, Chicago 16, Illinois.

SCREW Drivers. Shock resistant handles. Send \$3.00 for 8 assorted, including Phillips, regulars, stubbies. Free list of other tool bargains. Raymond Talbot, School Road, Perkasio, Penna.

DRILLS—Electric. New Black and Decker. Fully guaranteed. 1/4" only \$22.95. 1/2" only \$44.95. Dick Elison, Box 3366A, Glendale 1, Calif.

SHARPEN Screw drivers with ease. Amazing new bench grinder attachment. Shapes screw driver tips exactly as wanted. Literature free. Brush Mechanical Products, 377 N. McMillen St., Portland 12, Oregon.

BOATS, OUTBOARD MOTORS

FASTEST Boats in the world! Build your own Champion boat or let us build you a custom-made racer or family runabout. Send 25c today for catalogue of easy-to-follow plans for 3 point hydroplanes, runabouts and others. Dealer inquiries invited. Champion Boats, 1524 W. 15th St., Dept. 22-R, Long Beach 13, Calif.

GET Our big 228-page 1953 marine hardware, boat and equipment catalog. Send \$1.00 for packing and mailing, refunded with first order. Gariand Frasher Marine Sales, 540-J 31st Street, Huntington, W. Va.

MAHOGANAY, Redwood, fir, marine plywood. All lengths. Huebl Boats, LeSueur, Minnesota.

MARINE Propellers, 14", \$13.50; 16", \$16.75; marine manifolds for all engines. Jeep, #35; Model "A", #36; V-8, #45 pair; transmissions converted, marine paint, hardware, etc. Money back guarantee. Conversion Parts Company, 278 Adams Street, Boston 22, Massachusetts.

BOAT Patterns, kits. Thirty designs. Descriptive literature and illustrated boat construction book 50c postpaid. Germain Boat Company, West Saginaw 3, Michigan.

OUTBOARD Motor parts—New, used for all makes. Send stamp for price quotation, listing parts needed. Outboard Motor Mart, Inc., 229A State Street, Boston, Mass.

USED, Rebuilt engines. Free catalog conversions, fittings. Lind Supply, Farmington, Michigan.

FULL Size cut to shape boat patterns, blueprints, 7 1/2-38 feet. Illustrated "Build a Boat" catalog, 25c (coin). "How to Build Boats" book, \$1.00. PolyWog houseboat plans \$10. Marine catalog \$1.00. Cleveland Boat Blueprint Co., 3107 Detroit Ave., Cleveland 13, Ohio.

SAVE 2/3 Cost. Assemble your own boat. We furnish parts. No experience necessary. Rowboats, cruisers, illustrated catalog 25c. Midwest Boat Company, Menomonee Falls, Wisconsin.

MARINE Conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Company, 972D Broad Street, Newark 2, New Jersey.

"P38 Belly tanks," steel, \$9.95. Free picture. Bucks Auto Parts, Box 89, Merced, Calif.

NEW, Used, rebuilt marine motors. Marine conversions, fittings. Free catalog. Stokes Marine Supply, Dept. 24, Coldwater, Michigan.

CONVERT Fords and Jeep to 100% marine engines with Osco's world famous Convo-Kits. Deluxe catalogue 25c (coin). Oscomotors, 3627B Lawrence, Philadelphia 40, Penna.

ARE You interested in boats? Write for free copy The Rudder, a magazine on boats and boating. 15 Murray St., New York 7.

ENGINES, MOTORS, DYNAMOS

REBUILT Gasoline engines \$17.00 to \$37.00. Cauffiel Motor Industries, Temperance, Michigan.

WINDING Data, listing 225 motors, single and three phase, \$1.00. Motor Data Co., Box 7631, Kansas City 3, Mo.

ATHLETIC EQUIPMENT, BODY BUILDING COURSES

BARBELLS. Exercise equipment. Courses. Free booklet. Good Barbell Co., Reading, Penna.

"POLICE Jiu Jitsu." Authentic, illustrated \$1 postpaid. Satisfaction or money back. Books Publishing Co., 56-C W 24th St., New York 10.

DEADLY Judo—Fiercest fighting technique. Trick knockouts. (Over 200 illustrated pictures.) Expert instructions; three volumes. Complete \$2.25. Variety House, Box 46-B Wall Station, New York 5.

SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

POACHERS' Secret! Fish-bait-odours. Age-old proven formulas of gypsy and Japanese fish poachers. One drop, on any bait or lure, gets more fish and faster. Ingredients inexpensive at drug store—Mix as needed. Formulas with full directions, one dollar. H. P. Ayres, Box 101, Station K, Toronto 12, Ontario.

"FISH-Finder." Marvelous new invention delivers your bait to choice fishing spots across streams 300 feet beyond casting range. Only \$2 postpaid. Get free literature. Klissich Co., Cedar Rapids, Iowa.

TENTS, Canvas; direct from manufacturer. Also war surplus. Camping equipment, sleeping bags. Tremendous selections. Free catalogue. Low prices. Morrison Sales, Dept. PM-3, 10-15R 50th Avenue, Long Island City 1, New York.

SURPLUS Camping list 15c. Box 61, Falls Church, Va.

SEND 10c For list either rifles, shotguns, handguns, ammunition, or send 25c for all lists. Frayseth's, Willmar, Minnesota.

RED Wigglers, wholesale, 1000, \$4.00 postpaid. Groves Howell, Sneads, Fla.

FRENCH Revolver \$2; 22 rifle \$5; 1824 musket \$8; double-barrel 12 gauge \$10; arrowhead collection 70c. Rush 25c (35c first class mail) for catalog #510 listing other bargains in guns (new and old), swords, relics, etc. Jefscoc, Box 1682-CS, Toledo, Ohio.

FISHNIP, Poncho, Pegasus, Chum, Hookgaff, really catch fish. Inquire Moderne Fishing, Box #201, Glendale, Calif.

RAISE Large fishworms. Profitable. Wholesale. Alton Tozier, R.F.D. 3, Macon, Georgia.

SAVE High-priced ammunition! Hit what you aim at! Send today for the free wingshooters' handbook, "Straight From the Shoulder." The Poly-Choke Co., 814 Tunxis St., Hartford, Conn.

CAST Iron molds—For casting fishermen's sinkers. Free illustrated booklet. Reading Instrument Co., Box 78, Reading, Penna.

RAISE Fishworms. Outstanding opportunities. Detailed 15 page booklet explaining raising, feeding, packing, marketing. 25c. Ozark Worm Farm-J, Willow Springs, Mo.

ANTIQU Modern guns. Bargain list 10c. Martin Rywell, Harriman, Tennessee.

120 PROFUSELY illustrated pages antique pistols, swords, daggers, armor, etc. 50c. Robert Abels, M360 Lexington Ave., New York 21.

SHOTGUNS, Rifles, Revolvers, 500 modern, obsolete. Also cartridges. Each list 10c coin. Ed Howe, 52 Main, Coopers Mills, Maine.

5000 BARGAINS, Firearms, binoculars, war relics. Catalog 50c. Smith Firearms, Runnemed, N. J.

MOLDS, (For fisherman's sinkers, squids, jigs and lures.) Handed and hinged. Quality fishing tackle. Free catalogue. E. L. Sweet & Son, Tonawanda, New York.

TAXIDERM Y

MODERN Taxidermist Magazine, Greenfield Center 2, N. Y. Devoted entirely to taxidermy, photos, articles, methods. Trial year's subscription, \$1.00

BINOCULARS, TELESCOPES, MICROSCOPES, MAGNIFIERS

TERRIFIC Values, binoculars, telescopes, microscopes, \$3.95 up. Big money saving catalog on request. Criterion Co., Hartford, Conn., Dept. P2.

SAVE! Free 24-page, 3 color binocular catalog. 50 different models. United Binoculars, A-4208, 9043 S. Western, Chicago 20.

SAVE 50% On new binoculars! Free catalog. Free book, "How to Select Binoculars." Write today! Bushnell's, 43-M-35 Green, Pasadena 1, California.

BINOCULARS, telescopes, watches, guns. Buy, sell, trade. Schweer's, Donnellson, Iowa.

ALUMINIZED Telescope mirrors 3" to 12" diameters. Eyepieces, prisms, kits. Priced right. Post card brings plans, lists. Pfelegor Optical Co., P.M. 5, Sunbury, Penna.

WAR Surplus bargains. Binoculars, telescopes, sextants, millions of lenses, prisms, reticles, eyepieces, objectives, etc. Mail 10c for big "Catalog CH." Send \$1.00 for Stock CH—10-piece lens kit and big instruction booklet. Edmund Scientific Corp., Barrington, N. J.

MAKE Your 6" telescope reflector. Glass, abrasives, instructions—\$8.50. F. Cameron, Box 63, Inwood 96, N. Y.

POWERFUL Telescopic cameras easily made. Trifling cost. Telescopic Company, Manorville, N. Y.

ASTRONOMICAL Telescopes, binoculars, microscopes, bought, sold, repaired. Books, Lists 10c. Rasmussen-Reece, Amsterdam, N. Y.

REFLECTING Telescopes, 80X, completely assembled \$29.75. Guaranteed observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

AMAZING Prices, imported precision binoculars. Free trial. Pricelist, folder "Selecting Binoculars" free. Prentiss Importers, Mercury Bldg., Los Angeles 25, Calif.

POWERFUL Astronomical telescopes easily made. Perfect lenses and instructions; 100X \$3.00; 100X and 200X \$4.00; 100X, 200X and 400X \$6.00. Full power, clear vision guaranteed. Instructions alone 10c. Suffolk Science Service, Riverhead, N. Y.

BINOCULARS, Telescopes, microscopes. Our 20th year of leadership in optical values. Bargain catalog free. Brown-scope Co., 24 West 45th Street, New York.

REFLECTOR Telescope kits, refractors. Free illustrated bulletin. Esco Products, 911 Willow Ave., Hoboken, N. J.

GIANT Astronomical telescope with 6 ft. tripod \$15.00, f.o.b. factory. 100 power. (10,000 area magnification). Clear vision, full power guaranteed. Ready for use. Suffolk Science Service, Dept. BT, Riverhead, N. Y.

PETS—DOGS, BIRDS, RABBITS, HAMSTERS, ETC.

MONKEYS From South America. Native wild animals, birds, reptiles. Raccoons, demused skunks, pigmy skunks, black bears. Thompson Wild Animal Farm, Clewiston, Fla.

CHINCHILLAS—Not a rabbit. Quality breeding stock. Sawyer Chinchilla Farm, Established 1938, 711 East Street, Bucyrus, Ohio.

GEESE, Goslings, eggs. Safe shipment guaranteed. Books, magazine, explain profitable hatching, rearing, marketing methods. Peyton Goose Hatchery, R2DM, Duluth, Minnesota.

SOUTH American chinchillas for sale. Box 23, Hannacroix, New York.

YOUNG Parrots—Redheads and yellow-heads. Herb Miller, 1911-N, Lubbock, Texas.

BOXERS, St. Bernards, Hof Kennels, 5136 Cascade Rd. S.E., Grand Rapids 6, Mich.

BIG Profits—Raise Guinea pigs. Free booklet. Taylors, B426A, Hapeville, Ga.

CHINCHILLAS In 1951 netted \$20,000 for a Connecticut tobacco farmer, \$97,000 for ex-Seabee Eugene Donovan of Los Angeles, and brought middle-age retirement to Maine trawler skipper. Breed, sell registered Chinchillas. New low investment plan. (See March 3 issue of Time, Feb. 23 issue Collier's.) Start now! Write for our manual, "Chinchillas for the Small Investor." easy starter, success accounts, cooperative assistance plan for average wage-earner. \$1 postpaid. National Chinchilla Clubs, Box 6307, Five Points Station, Raleigh, N. C.

CHINCHILLAS—The finest fur-bearer in the world. Start your herd from prize winning stock. Cash or terms. Send 25c for booklet on how to raise. Old Saybrook Chinchilla Farm, James S. Nihil, Main St., Essex, Conn.

EARN Up to \$400 monthly raising Angora or New Zealand rabbits. Plenty markets. Particulars free. White's Rabbitry, Newark, Ohio.

RAISE Rabbits. Profitable business. Free booklet. Tayco Rabbitry, Hapeville, Ga.

HAMSTERS—Golden or spotted. Cages and equipment. Free illustrated details. Lakeview Hamster Colony, Newfield, New Jersey.

BOOKLET "Treatise on Breeding and Raising Canaries"—\$1.00. Audubon Publishing Co., 3449-PM N. Western, Chicago 18, Illinois.

MAKE Big money! Raise Chinchilla rabbits. Cash markets supplied. Write today! Rockhill Ranch, Sellersville 15, Penna.

MINK Raising information free. Complete. Lake Superior Mink Farm, Superior, EEL, Wisconsin.

A Practical beginning to successful rabbit raising. 48 page illustrated booklet. Dime. American Rabbit Breeders Association, 36 AR & CBA Bldg., Pittsburgh, Penna.

PLANTS, SEEDS, NURSERY AND GARDEN SUPPLIES

GINSENG, Goldenseal, Hundred seeds \$1.50; thousand \$5.00. Dozen plants \$1.50; hundred \$9. Growing-selling instructions included. F. M. Collins, Viola, Iowa.

FARMS, FARM LANDS, REAL ESTATE

STROUT'S Two catalogs. Farms, homes, businesses, 3646 bargains, 31 states. East and mid-west green cover; west coast edition yellow. Either free. World's largest. Strout Realty, 7 So. Dearborn St., Chicago 3, Ill.

\$345 FLORIDA Ranches. Pay \$15 monthly. Beautiful, extra large homestead garden tracts. High and dry. Electricity. Ready for building your home, planting your garden, fruit and nut trees, berries, flowers, etc. Near famous Panama City pleasure resort with world's finest beaches. Many lovely lakes. Wonderful fishing, hunting. Glorious year-round climate. Hurry—Send today for free booklet. Wendell Wood, Box 873, Houston, Texas.

UNITED Farm Agency's new free summer catalog of farm and country real estate bargains. Just off press. Can help you plan soundly for your future security in the country. Good pictures, many states, easy terms, many equipped, growing crops included. For special service, state requirements, desired location. Write for your catalog today. It's free! United Farm Agency, 220-PM South State St., Chicago 4, Ill.

FLORIDA—Hunting, fishing, fruit growing. 5 acres, \$245.00, \$10.00 down, \$10.00 month. G. B. Potterfield, Union Building, Charleston, West Virginia.

FARM And business catalog free! Big new edition. Over 1000 bargains from \$1000 up. Maine to Florida. West's, M-5, Pittsburgh 17, Penna.

ARMSTRONG Farms—Timber, grazing, minerals, fruit, retirement lands. \$5.00 acre. Write today. Armstrong, Shook 34, Missouri.

CALIFORNIA, Oregon, Washington land. Acres and acres of virgin soil. Ideal for farming, ranching, resorts, etc. Sacrificed for delinquent county taxes. Your opportunity to buy now from \$5 to \$10 per acre full price, including 100% oil and mineral rights. Send 10c (coin) for full details, catalog, photos. Pacific Lands, Box 2350 BW, Hollywood 28, California.

CANADIAN Tax sale lands for two dollars an acre and up. Small monthly payments. Farms, timber, hunting and fishing camps, minerals. Limited number of properties. Write at once for free catalogue. Tax Sale Service, Room 105, 120 Bloor St. W., Toronto 5, Canada.

\$5.00 MONTHLY Buys 40 acres near town; price \$200.00. Free list. Box 425-P, Carthage, Missouri.

FARM—Ranch opportunities. Favorable conditions. Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Literature, farm descriptions. Specify which state. J. W. Haw, 119 Northern Pacific Ry., St. Paul 1, Minn.

HOMESITES \$300—Convenient payments. California's finest garden section. On Morro Bay's scenic shores. Wonderful fishing, boating, bathing. Fertile soil, softest water, temperate climate, congenial community. Free literature. Richard Otto, Department M, San Luis Obispo, Calif.

POULTRY, FARM SUPPLIES

KNOW How to raise poultry for profit. Read Poultry Industry. Every issue packed with helpful hints and practical suggestions. Latest articles on breeding, feeding and management. Subscribe now, 1 year 50c, 3 years \$1.00. U. S. funds or checks payable at a New York or Boston bank. Poultry Industry, Dept. PM, 376 Boylston St., Boston 16, Mass.

RAISE Turkeys the new way. Write for free information explaining how to make up to \$3000 in your own backyard. Address National Turkey Institute, Dept. 3, Columbus, Kansas.

PROFITABLE OCCUPATIONS

WANT A diesel job? New opportunities to increase income. Higher pay. More money. We can help you qualify. Tools. Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division, Interstate Training Service, Dept. 3E, Portland 13, Oregon.

\$4 TO \$10 Hour spare time. Billion-dollar adjustment field. Free book—Now! Universal Schools, M-57, Box 8202, Dallas 5, Texas.

START A buying service, buy wholesale thousands nationally advertised products. Make big profits selling at sizable discounts. Send postcard for details. American Buyers Service, 627-R Linden, Buffalo, New York.

BE independent! \$200 weekly possible. No selling. Based on profit-tested idea. Unusual operation. Plan \$1.00, details free. Lurene Business Plans, P.O. Box 4692, San Francisco, Calif.

CHINCHILLAS (No rabbit). Raise anywhere. Pleasant, profitable. Information. Chinchillas, Ithaca, Michigan.

BE Your own boss! Free book "163 Unique, Successful Businesses" tells how. Start spare time, small capital, work home. Deumant Publications, 81-F Deumant, Kenmore 23, N. Y.

BE The Popular Mechanics representative in your neighborhood and earn big profits in your spare time. Write Popular Mechanics Magazine, Room 408M, 200 E. Ontario St., Chicago, Ill.

CONSTRUCTION Workers. Want to make better jobs? Longer jobs? Latest information. Jobs breaking. Jobs underway. North, south, east, west. The best. Big job list. Accurate. Up to date. Send one dollar. Dempster's Construction Scout News, Dept. 268-JF, Bridgeport, Ill.

FOREIGN Employment construction men. building trades, helpers, office men, others. Interested in foreign projects. High wages, quarters, transportation. Send \$1 for foreign construction compendium and application forms. Foreign Service Bureau, Dept. PM-5, Metuchen, New Jersey. (Not an employment agency—No fees.)

MUSHROOMS Grown. Boxes. Barrels. Instructions 50c. Spawn \$1.00. Manureless process. \$2.00. Gordons, 328 Bannerman, Winnipeg, Manitoba.

FOREIGN Jobs. Contracts underway and soon starting in Africa, South America, Canada, England, Europe, South Pacific, Middle East, Mexico and Alaska. Send \$1.00 for foreign job news, information, application forms, etc. DCS Foreign Job News, Dept. 268-JG, Bridgeport, Ill.

ADDRESS Our postcards. Send stamped envelope for reply. Wilson Publishers, 1987 Studer Ave., Columbus 7, Ohio.

BE A flower preserving specialist. Instructions 25c. Box 874, Joliet, Ill.

MEN. Women visit foreign countries on modern ships. Big pay, adventurous living. Experience unnecessary. Details free. Davenport, 1170-K Broadway, New York City.

SEND For big, new 1952 illustrated catalog that will show you how to turn your spare time into cash—making quick-selling, highly profitable lamps. Every home a prospect. Hundreds doing it, you can, too. No experience or special tools required. Catalog No. 7 contains 56 pages filled with shades, shade frames, figurines and bases, oil lamp converters, boring compound, and dozens of similar items. Also all kinds of sockets, cords, pipes, harps, finials, bases, and hundreds of other parts—everything you need. Special 8-page section shows 6 beautiful lamps in kit form, ready to assemble. You buy wholesale, sell at retail. Make big profits. Send 25c today for new 1952 catalog and wholesale price list, you'll be glad you did. The 25c will be refunded on your first order. Gearon Co., Dept. 500-B5, 27 S. Desplaines, Chicago 6, Ill.

OIL Lamps electrified—Popular in home furnishings. Easy, highly profitable business at home. Antique shops, homes prospects. Learn to wire oil lamp with light in bowl, make lamps from vases, bottles, etc., bore glass, silver plate, etc. Charts and directions in "How to Build Lamps" contained in 64 page illustrated catalog of sockets, cords, bases, converters, vase caps, dome and ball shades, chimneys, fittings, etc. Send 25c. Gyro Lamp, 5402 PM Clark, Chicago 40.

ASTROLOGY. Correspondence course. Particulars. Reede, 223 Strathmore Blvd., Toronto 6, Canada.

ALASKA. The undeveloped land of fortune. Employment, investment, business. Men interested in civil and military development projects. Highest wages. Gov't. homesteads and homesites. The Alaska Highway. Gov't. tracts \$2.50 per acre. Tourist trade, small business opportunities, commercial fishing, mining, agriculture, forests and furs. Send \$1.00 for complete Digest of Territorial Employment Service and opportunities in Alaska. Foreign Service Bureau, Dept. PM, Metuchen, N. J.

MAKE Flexible molds! Cast plaques, bookends, figurines! Free sample! H. Tooker, 630-M Chestnut, Hamilton, Ohio.

ALASKA! Just released! Over 50 gigantic new construction contracts! Names, addresses, companies hiring, \$1.00 complete. Alaskan Opportunities, (PM) Box 362, Kenmore, Wash.

FOREIGN And Latin American employment. 1952 "Foreign Service Directory" gives up-to-minute facts on military and civilian construction, government jobs, major oil listings, aviation, transportation, steamship lines, mining, importers, exporters, how-when-where to apply, application forms, hot list firms hiring. \$1.00 postpaid. Global Reports, P.O. Box 583-P, Hollywood 28, Calif.

FREE Book "503 Odd, Successful Businesses." Work home. Expect something odd! Pacific, Oceanside, Calif.

OWN A printing business. Good profits printing cards, stationery, etc., in spare time. Easy rules furnished. Have home shop. Send dime for illustrated printer's supply book and samples. Kelsey, Inc., T-24, Meriden, Conn.

"EVERYBODY Likes candy"—Learn to make professionally. (Our 40th year.) Ragsdale Candies, D6, East Orange, New Jersey.

ALASKA—Last American frontier. \$1.00 brings 1952 business directory, government map, construction projects military and civilian, homestead and highway facts, hunting-fishing-game rules, mining, aviation. List of firms hiring. How-when-where to apply. Alaska Opportunist, P.O. Box 883-P, Hollywood 28, California.

RAISE Pheasants on the \$100 week plan. Little capital and space can make you independent. Free details. Great Central Game Management System, Columbus 1, Kansas.

\$40.00 WEEKLY Made growing mushrooms, fresh, dried. Dominion patent 331583. Free spawn. North American, 169P Yonge, Toronto, Canada.

BOOKS, PERIODICALS, PICTURES POSTCARDS

RAILROAD Photo albums. Also model magazines. List for dime. Refunded. Frederick Woods, Livingstone, Beverly, Mass.

125 PAGE Short method arithmetic 50c. Free technical catalogue. Stein's, 521 So. State, Chicago.

10 SCENIC Postcards of Paducah, home of Alben Barkley. 35c. Jerry Toof, 3939 Sunset Ave., Paducah, Ky.

READER'S Digest Magazine, 8 months, \$1.00. Bedard Publications, Box 637, Detroit 31, Michigan.

BOOKS—Government surplus. Textbooks, including International Correspondence Schools Home Study Pamphlets. On half million volumes. Bargain prices. Free catalog. Long's College Book Co., Dept. PM, Columbus 1, Ohio.

BOOK Bargains! \$1.00 each. "Peace of Mind," Joshua Liebman; "How to Stop Worrying," Dale Carnegie; "How to Remember Names and Faces," R. H. Nutt; "Art of Living," Norman V. Peale; "It's Easy to Train and Raise a Puppy," Bob Becker; "Poems That Touch the Heart," A. L. Alexander. Write for complete list. Philmark Books, 48 Williams Street, Norwich, Conn.

"THOUGHT Of Using Sleep for Learning, Self-Improvement?" Fascinating science explained: "Mental-Power Through Sleep-Suggestion," \$1. Melvin Powers, 1324 Wilshire, Los Angeles 17F, California.

LOST Mines of the Old West, by Howard Clark. Authentic stories of "Pegleg" and 21 other fabulous lost mines. 75 cents plus 3 cents tax. Nichols Wilson, 174 Leroy, Arcadia, Calif.

DRUM Majorette photos taken at parades, 32 different \$1.00. Frederick Forman, 868 Lorimer, Brooklyn 22, N. Y.

"EXPERIMENTERS Handbook" "Judging Gems," other unusual instructive publications. Free list. Technicraft Publishers, 3207 Winnie Drive, Hollywood 28, Calif.

HOW To Retire Magazine, Winchester, Ohio. Copy 25c. Year \$2.00.

SPARETIME Profits taking subscriptions all magazines. Wholesale catalog free. Cassell Publishers, Westfield 5, N. J.

CATALOG 400 Popular books. Bargain prices, 10c. Books Publishing Co., 56-F W. 24th St., New York 10.

MAGAZINES (Back dated)—Foreign, domestic—Arts, books, booklets, subscriptions, etc. Catalog 10c (refunded). Cleerone's, 86-22 Northern Blvd., Jackson Heights, N. Y.

BOOKHUNTERS! All subjects. Send wants! Jaher Book Service, 620-P East 178 Street, New York 57.

BOOK "Breeding of Parakeets" and cage-bird magazine—\$1.00. Audubon Publishing Co., 3449-PM N. Western, Chicago 18, Illinois.

BOOKHUNTERS! Scarce, unusual, miscellaneous books supplied. Atlantic Book Service, Lawrence Avenue, Charlestown 29, Massachusetts.

MAGIC TRICKS, PUZZLES, JOKER NOVELTIES

VENTRILOQUISM Taught. 3c stamp brings particulars. Smith, 801 Bigelow, Peoria 5, Ill.

3 CARD Monte trick and catalog 25c. Sterling Magic, Royal Oak, Mich.

GENUINE Wooden nickels, magic catalog and trick, all for 35c. Fun 'n Magic, 511 N. St. Marys, San Antonio, Texas.

512-PAGE Catalogue of 2500 tricks, pocket, parlor, stage. World's finest magic. Send \$2.00 for catalogue (refunded first \$3.00 order). Kanter's, M-1311 Walnut, Philadelphia 7.

ENTERTAIN! "Expert at Card Table," "Coin Magic," "Three-Shell Game," \$2.00 each. "Divisions with Dice," "Pictures in String," "Juggling," "Chalk Cartooning," \$1.00 each. List free. Fleming's (world's largest magic book dealers), 728 Madison, York, Penna.

SPECIAL Offer—5 amazing pocket tricks, \$2.00 value, and big illustrated catalog of magic, tricks, and jokes, all for \$1.00. Earl's Fun Shop, 9131 So. Broadway, Los Angeles 3, California.

VENTRILOQUISM Self taught. Quick, easy instructions, 25c. "Ventriloquist," Cal Allen, Texas.

FREE Trick and large illustrated catalog 35c. Lerro Magic, 8111 Fifth Avenue, Brooklyn 9, N. Y.

WORLD'S Largest magic shop. Special: Big \$2 book of professional magic tricks, only \$1. Includes mailing lists. Holden's, M220 West 42nd St., New York.

MAGIC Monthly, year 25c. New 1952 magic catalogue 10c. New joke lists 5c. Magic Factory, Minneapolis 2, Minn.

PROFESSIONAL Catalog and free trick 35c. Terry's Magic Studio, 6606 Duryea Court, Brooklyn 19, New York.

BIG Fun kit! Tricks, jokes, novelties, books. Real clever stuff. Howls galore, \$1.00. Johnson, 414 McRae, Wilmington, N. C.

LATEST Magic for pocket, parlor, stage. Catalog 500 tricks, only 10c. Unequaled magic service for 30 years. Douglas Magicland, Dept. 1, Dallas, Texas.

PROFESSIONAL Catalog, 124 pages, 25c. Williams, 900 Plymouth, Ellwood City, Penna.

BE A magician. Large professional magic catalog of latest tricks, 35c. Ireland, C-109 North Dearborn, Chicago 2.

COINS, TOKENS, CURRENCY

WHAT Are your coins worth? Amazing Fell's United States coin book. Everything on every single coin minted—Worth, value, how to sell, speculating, investment; other valuable facts on coins. Cloth-bound, 150 illustrations. Send no money. Pay postman only \$1.50 (plus postage) or \$1.50 postpaid (refundable). Order now! Fell Publishers, 386M2 4th Ave., New York 16, N. Y.

OLD Money wanted. Do you know that coin collectors pay up to \$100.00 for certain U. S. cents? And high premiums for all rare coins? We buy all kinds. Send 4c for large coin folder. May mean much profit to you. Numismatic Co., Dept. 20, Fort Worth, Texas.

SET Nine Japanese invasion notes for U. S. \$2.00. Catalogue thousands of coins, 25c. Shultz, Salt Lake 10, Utah.

COINS Bought and sold. Illustrated list 10c. Nelson Exchange, Rye, N. Y.

INDIAN Cent and lists, 10c. Bolus, 1139 11th N.W., Canton, Ohio.

100 COINS And bills, \$1.50, 65 coins and bills, \$1.00. Oddehon, Box 482, St. Louis, Mo.

WANTED—1894-S Dime, pay \$500. Certain 1913 nickel \$1,000, 1901-S quarter \$20 to \$150. Hundreds of others. Know their true value. Complete illustrated catalogue 25c. Worthycoin Corporation (D-325), Boston 8, Massachusetts.

WE Pay \$5 to \$500 each for hundreds of old or odd U. S. and foreign coins. Keep all until posted. Send 20 cents for illustrated coin value book, with bargain lists free. 45 years in business. Coin Exchange, Le Roy 7, N. Y.

FREE! Foreign coin, banknote and coin collectors illustrated catalog to approval service applicants. Send 3c postage. Tatham Coinco, Springfield 30, Mass.

FIFTY Assorted Indian cents, \$1.50. Rare 1931-S cents, \$1.00. Giant fifty-two page illustrated bargain catalog, 10c. Ben's PM Department, 31 North Clark, Chicago 2.

COIN Collector's Magazine. Largest independent, over 1000 pages per year. Sample copy 30c; \$3.00 per year. Hewitt, 5450-J Clark, Chicago 40.

FOREIGN Money, wooden nickels, and "coin collector's" big new magazine 10c. Lawrence Brothers, Anamosa, Iowa.

GET Profit and pleasure in collecting old coins. Send 10c for 56 page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 370 Mehl Bldg., Fort Worth Texas. Largest rare coin establishment in U. S. Established 52 years.

STAMP COLLECTING

FREE Stamp "circus" giants, pygmies, kangaroos, snakes, rhinoceros, ostriches, with approvals. Niagara Stamp Company, 17 Queensway, Niagara on the Lake, Can.

ILLUSTRATED. Complete U. S. list—6c postage. Olsen, 1030 Euclid, Cleveland 15, Ohio.

NEW Issue Journal—Free—This month and every month. From Stamp Korner, 160 North 2nd St., Decatur, Indiana.

STAMPS—World different. 1000, \$1.00; 2000, \$2.25; 3000, \$5.00. Mounted 5000, \$13.00; 10,000, \$43.00. Russell, 2011D Natural Bridge, St. Louis 15, Mo.

FREE! Pictorials—Penny approvals. Pegram, Box 785, Huntington Park, Calif.

SPECIAL! U. S. mint flag set, complete—\$1.00. Want lists filled. Brooks, 2352F East 23rd Street, Brooklyn 29, New York.

FREE—"German war issues," cataloging \$10.82 to approval buyers. Royal Stamp Company, Tamaqua, Penna.

UNITED States all different. 8 airmails plus 50 others including commemoratives, for 10c to approval applicants. Sunset, Dept. 139, Box 47, South Gate, Calif.

ALBUM! Holds over 1000 stamps! Only 10c! Stampmart, Hartford 1, Conn.

PENNY Approvals that satisfy. Neil Gronberg, Box 5441-P, Philadelphia 43, Penna.

FREE! 100 Different China. Contains airmails, commemoratives, twin map stamp, others, to new approval applicants. C. Momblow, 740 Hegney, Bronx 56, N. Y.

WONDERFUL Offer—7 complete mint sets Manchukuo, etc. Only 10c with approvals. Reich Stamp Co., 4647 Kenmore, Chicago 40, Dept. M25.

WORLDWIDE Approvals—1c up. Department W, 1267 Tutwiler, Memphis 7, Tenn.

100 WORLDWIDE Free! Approvals. 3c. Zampino, 2337m Bath Avenue, Brooklyn 14.

FREE: Mint British Colonies from Niue, Gilbert Ellice, Nauru, Turks Caicos, Brunel, Caymans, Tonga, Pitcairns, Sarawak—Free with approvals. Viking, 130-2 Clinton St., Brooklyn, N. Y.

NAME The country, receive only the stamps you collect. Mounted in booklets by countries on approval. At reasonable prices. References please. House of Stamps, 19281-B Mound, Detroit 34, Mich.

DEALERS—Wholesale list. Postage 3c. Frank, 5031 Queensberry, Baltimore 15, Maryland.

TEN Dandy sets 10c. Approvals. Faszold, 423c Cameron, St. Louis Co. 15, Mo.

FLAG Stamp—Free with hygrade U. S. approvals. Wenigman, 1933 Patterson, Chicago 13.

OLD Scarce U. S. seconds on approval. Slightly defective. Bargain prices. Hernefield, Clintonhill Station, Newark 8, N. J.

50 DIFFERENT Scandinavian 12c in stamps. Kimber, Box 278, Norrkoping, Sweden.

MYSTIC Treasure mixture—1,250 fascinating world. \$1.00. Long Beach Stamp Company, Long Beach, New York.

1000 UNIQUE Colorful attractive book mounted stamps 1c-2c each. Rushed. Niagara Stamp Company, 11 Queensway, Niagara on the Lake, Canada.

SCANDINAVIA—100 Different. 20c! Netherlands, 100 different. 20c! Free lists. Olsen, 1030 Euclid, Cleveland 15, Ohio.

U. S. Illustrated price list free. Lush, 9627A Martindale, Detroit 4, Michigan.

FREE Complete set of famous Americans, flags, parks and presidentials to approval buyers. Send 3c for 15 of the above stamps plus full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 105, New York 38, N. Y.

CANADIAN Collection free — Includes early Victorian issues, jubilees, high values, commemoratives, special issues, Newfoundlands, pictorials, etc., etc., together with Philatelic Magazine all free. Send 5c postage. Empire Stamp Company, Dept. PM, Toronto, Canada.

PAYING High prices for approvals? If your collection numbers under 15,000 try our 1c and 2c approvals. In books of 1,000 different. Lots to choose from at lowest prices. Also special offer to customers. Clark, Box 544P1, Muskegon, Michigan.

PAY Check gone? Are you paying too much for approvals? Try our books of 1,000. Priced at 1c and 2c each. Reference appreciated. Roseland Stamp Co., Dept. 10-A, Spring Lake, Michigan.

POUND Stamps containing thousands \$1.00. Longacre Shop, 581 Sixth Ave., New York 11.

PROFITABLE Sideline. Start your own stamp business. "Stamp Dealers' Manual" \$1.00. Brightwood, Box 6255, Pittsburgh 12, Penna.

1,021 DIFFERENT Stamps \$1. Monaco collection of triangles, nudes, Roosevelt issue, Pope Plus issue, Prince Ranier, plus new bicolored Columbus set plus new Bolivian sports issue plus collection of 1,001 different stamps. Everything \$1.00! Approvals included. Stampex, 116-MR Nassau St., New York City.

FREE! Outstanding booklet! "Easy way stamp collecting!" Big 44 page illustrated catalog! Send today! "Stamps by Mail," 2133 Lant, Chicago 45.

STAMPS Wanted. Collections, duplicates, surplus stock, mint and used. Good grades only. Buy outright if bargain. What have you? Write us details. Vanroy Shirk, Lebanon, Penna.

MINT U. S. 797 SPA sheet, 10c to applicants for U. S. approvals. M. Haycock, 235M 86th St., Brooklyn 9, N. Y.

LOOK! 25 Different Uruguay only 10c. Catalog 70c. Lucas, Box 387, Lombard, Illinois.

110 WORLD Different. 25c. Approvals optional. H. Washington, 1169 Hillsdale, Topeka, Kansas.

EXCHANGE—Send 100 different foreign stamps with 25c and a stamped, addressed, return envelope. We send you 100 others. 1050 Wapello, Altadena, Calif.

"OSTLAND" 18 Different 25c. Approvals. Arnold, 710 14th St., N.W., Washington 5, D. C.

ARMENIA Pictorials, worth 75c, free with approvals. Sunvalue, 1735 S.W. 11th Street, Miami, Florida.

STAMP Wallet containing Hitler heads 3c with approvals. Amberg, 537J 35th, Union City, N. J.

WORLDWIDE Variety packets 100 10c; 500 60c; 1,000 \$1.25; 2,000 \$3.25; 5,000 \$13.75. Philatelic House, 189 Merrick Rd., Rockville Centre, N. Y.

100 DIFFERENT U.S. old, new. 25c. Lists. Weatherby, Medina, Ohio.

"GENERAL MacArthur" Philippines, Brazil "Truman" commemoratives; free to approval buyers. William Deem, Ravenswood, West Virginia.

100 DIFFERENT France, 9c. Approvals. Aronson, 91 Marion, Brookline 46, Mass.

200 DIFFERENT, Triangle, airmail, pictorials, etc., 10c. Carlton's, Tujunga, Calif.

AMERICAN Locomotive, Japanese sheet—Lovely engraved souvenir sheet. Japan 396, depicts old American locomotive. Superb album piece, 10c to approval applicants. Mitchell, Box 923mh, Portland, Maine.

PROTECTIVE Mounts beautify collections. Free samples. McClellan, 2711 Oak, Shreveport, Louisiana.

BEAT This if you can! Over 520 different stamps, catalog over \$11 for only 25c to serious adult approval applicants. Free illustrated price list. Cosmophilatelist, Andover, N. J.

500 DELUXE Foreigns. No junk. 60c. Guaranteed. Reico, Morrison 31, Okla.

200 UNIVERSAL Different stamps, 10c. Charlie Seifert, Box 1672, Reading, Penna.

1/2-1-2c APPROVALS. Bargains galore! Cole, 43A Rinewalt, Buffalo 21, N. Y.

50 DIFFERENT U. S. commemoratives. \$2.00 catalog value. Good foreign. Both \$1.00. Hager, Box 10, Buffalo 11, N. Y.

25 DIFFERENT Czechoslovakia, 77 different United States, scarce Cuban set, hinges. Only 50c. Approvals. Utechts, 1143D North Keeler, Chicago 51.

40 DIFFERENT U. S. commemoratives, airmails 25c. Seidenberg, 944, Appleton, Wis.

FREE 109 Stamps to applicants for our approvals sending 3c postage. Hoyt, Lowell Road, Hudson, N. H.

18 VALUE Greece pictorial set. Free to approval buyers. Pleasure Stamps, 1865P 52nd, Brooklyn 4, N. Y.

50% DISCOUNT Approvals—Many bargains. Gaines, 716-S Sixteenth, Mattoon, Illinois.

FREE Sample—Interesting, informative, illustrated! National Stamp News, Anderson, South Carolina.

AMAZING Offer! 500 United States stamps—including commemoratives, airmails, high denominations to \$5.00. Only 15c to approval applicants! Illustrated bargain lists free. Mystic Stamp Co., Dept. 80, Camden, New York.

FREE! Rare Nigeria shilling value; Cyprus-Ceylon pictorials; U. S. special delivery set! With bargainful approvals. "PG," 195 Park, Lewiston, Maine.

FREE U. S. and Confederate states catalogue. Stone, 45 Bromfield, Boston 8, Mass.

1000 MIXED U. S. and foreign 25c. Book Nook, Willmar 80, Minnesota.

FREE Very large Japan Flying Geese Stamp. Approvals included. Hathaway, P.O. Box 211-P, Hempstead, New York.

FINE Approvals. Fast, personal service. What countries do you prefer? I'll send their stamps. Skinner, 438 Locust, Long Beach 12, California.

100 NETHERLANDS. All different. Beautiful assortment, 10c with approvals. Thomson's, Box 4074-P, Miami, Florida.

POLAR Bear triangle, giant George Washington, six colored Ecuador, Arctic triangle, first American commemorative, Corsica, Devils Island, others. Everything free with approvals. Capital Stamps, Little Rock 2, Ark.

UNITED States stamps nearly 100 years old, Roosevelt set, others. 40c value—only 5c to applicants United States approvals. Wakonda, Box 272K, Jackson Heights, N. Y.

FIRST U. S. (1847) government reissues 5c, 10c, plus giant bargain U. S. collection—only 5c to applicants U. S. approvals. Metropolitan, Box 312G, Jackson Heights, N. Y.

BEAUTIFUL N.Z. semipostal triangles picturing British Princesses only 10c with worthwhile approvals. George Richie, 1539 Sixth, Alameda, California.

FREE—Illustrated catalog! Kenmore, Milford, C-57, N. H.

GET This! Airmail book, plus over 100 airmail stamps—only 15c. Thrilling stories, valuable information on beautiful airmails from the world over including \$10,000 airmail—all for 15c! Big bargain lists and approvals. Jamestown Stamp Co., Jamestown 708, N. Y.

PENNY Approvals by country. M. H. Hoerning, 15, Farmington, Ark.

"HOW To Recognize Rare Stamps." Free book illustrated! Kenmore, Milford, H-57, N. H.

U. S. Illustrated price list free. DeLisle, 154 S. 2nd St., San Jose, Calif.

FREE. Scott's International Album. Other big premiums. Full particulars with approvals. Raymax, 68-Z Nassau St., New York 38.

500 EXOTIC Japan stamps—10c. Kenmore, Milford, J-57, N. H.

TALKING Drums (Gold Coast): 2 Nicaragua triangles, 55 other beauties, total catalogue \$2, all only 2 dimes. Approvals. Reuter, 611 W. 40th Pl., Los Angeles 37.

DIFFERENT 500, 35c; 1000, \$1.00; 2000, \$2.00; 5000, \$10.00 with approvals at wholesale to clear. K. S. Holmes, London, Can.

U. S. Army and Navy heroes on stamps; 10c with United States approvals. Locust, Box 305-T, Harmon-on-Hudson, New York.

COMPLETE New Issue free to new approval applicants. Paul Seaman, Box 176, Langhorne, Penna.

110 DIFFERENT Hitlers, Roosevelt, Liberia, Haiti, etc. with approvals 10c. Buckey, 208 Ludlow Bldg., Dayton 2, Ohio.

U. S. Price list free. P. Wetterquist, 1635—13th Avenue, Rockford, Illinois.

100 DIFFERENT Spain 25c. Penny approvals included. Reed, Box 980, Chicago 90, Ill.

50,000 STAMP Grabbags 25c each. Anderson, 630B Bingham, Reading, Penna.

FREE Collection — Over 100 different stamps of world; commemoratives, animals, natives, ships, famous men, others all to approval buyers; also Scott albums, catalogs. Bell Stamp Service, Dept. S-2, Bell, Calif.

START Your own stamp business. Send for free circular. Donald Shepard, Box 1147, Chicago.

FREE! Powerful magnifying glass. Jamestown Stamp, Jamestown 202, New York.

200 DIFFERENT Including Roosevelt triangle, 5c to approval applicants. M. Avalon Stamp Company, Springfield, Mass.

NICARAGUA Sports. Costa Rica agriculture sets 10c with approvals. Seminole Stamps, Box 1138-P, Coral Gables 34, Fla.

UNITED States approvals—Select, used, mint. Kingsbury, South Woodbury 2, Vt.

10,000 DIFFERENT 1c Each! Gordon Davison, Box 1019S, Manchester, N. H.

50%-75% DISCOUNTS! Approvals from 33,000 collection—1/2c up! Schur, Box 235, Buffalo 12, N. Y.

NOTHING Free. Just good stamps reasonable. Send dime for seventy-four page catalog. Ben's Stamp Shop, 31 N. Clark, Chicago 2.

FREE "Stamp Finder." Tells instantly country to which any stamp belongs. 32 pages profusely illustrated. Garcelon, Calais 17, Maine.

WOW! 203 All different Germany 10c! Zeppelins, semipostals, airmails, high values, etc. to new customers. Jamestown Stamp, Jamestown 512, New York.

WORLD'S Largest stamp (7 1/2 x 14 inches). A real curiosity! Retail for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 30, Mass.

500 STAMPS For only 10c! This mammoth value includes airmails, pictorials; stamps from strange countries, cataloging up to 25c each! Also approvals. Mystic Stamp Company, Camden 90, New York.

ANTIQUES, RELICS, INDIAN GOODS, CURIOS

INDIAN Beadwork, leathers, beads, feathers, moccasins, wigs, supplies; buying direct from Indians; prices reasonable. Free list. Pawnee Bill's Indian Trading Post, Box 35-P, Pawnee, Oklahoma.

ANTIQUE Handguns popularly priced. Beginners or general collectors list 10c. Hi-Fulton Gun Corner, 413 South High, Columbus 15, Ohio.

PRECIOUS STONES, MINERALS

JADE, Agates, titanite, gems, hobbyists supplied, gem cutting machines. Free list. North West Gems, Box 305, Tacoma 1, Washington.

PROSPECTOR'S Handbook: Identify mineral ores quickly, positively, \$1. Research, Box 1124-PM, Knoxville, Tenn.

GEMS, Precious and semi-precious, genuine, from world-wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., 5450-G Portland Rd., Salem, Oregon.

GEMCUTTING. Silvercraft authority. Illustrated magazine tells how. Cut rocks, make jewelry. 150 ads illustrating equipment, offering gems for collectors, cutters. Postal brings literature. Lapidary Journal, Drawer B, Palm Desert, Calif.

GEMSTONES, Mineral specimens. Every variety. Lowest prices. Postcard brings free booklet. Plummer's, 2183C Bacon, San Diego 7, California.

HOBBIES AND COLLECTIONS

DRILL Through glass—New guaranteed method. Special bit and instructions, \$3.00. Ramyers, 534 Kemper, Glendale, Ohio.

20 DIFFERENT "Souvenir ship matches" \$1.00. Free lists. Yeingst, 502 Parkway, Harrisburg, Penna.

FREE Catalog. Miniature bars and cabinets. Small glass animals filled with fruit cordials. Write Bottled Curios, Calumet Building, Miami 32, Florida.

"COMMODORE'S Commission" in Confederate Navy. Beautifully prepared, your name inserted. Mail \$1. Southern Documents, Box 4607, Jacksonville, Fla.

WANTED — Cigarette, tobacco cards. Write Charles Bray, East Bangor, Penna.

COLLECT Cartophilic cards—Fascinating hobby. Free sample packet and illustrated magazine for 10c postage. International Cartophilic Company, Dept. PM, Toronto, Canada.

LEATHERCRAFT For pleasure or profit. Make easy-to-assemble purses, belts, gloves, woolskin toys, 100 other items for gifts or to sell. Send 10c today for big catalog. Largest leathercraft stock in U.S. J. C. Larson Co., 820 S. Tripp, Dept. 2051, Chicago 24.

UNUSED Matchbook covers—100 different \$1.00 36-page catalog 25c. Charles Edelman, 1311C East 84, Cleveland 3, Ohio.

INVENTING Can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 40-E 631-E St. N.W., Washington 4, D. C.

CAMERAS, PHOTO SUPPLIES

BUY Photographic supplies wholesale, films, cameras, projectors. Expert camera repairing. Free catalog. Capitol Photo Supplies, 2426 Guadalupe, Austin, Texas.

DON'T Buy a tape recorder before writing to Dressner, 634-M East 20th Street, New York 9, New York.

WANT To sell, buy or trade cameras the best way? Write for free copy of Phototrader, Box 630, Westport 1, Conn.

BUY Photographic supplies wholesale. Films, cameras, projectors, enlargers, binoculars. Free catalog. Capitol Photo Supplies, 2426 Guadalupe, Austin, Texas.

PHOTOCOPY Anything—Papers, books. No darkroom, 8 1/2" x 11" complete \$6.95. Photoflek, 8555 Plainfield Lane, Cincinnati 36, Ohio.

FREE Photographic bargain book packed with hundreds of sensational values in still and movie cameras, lenses and latest accessories. Super savings for you in new and used equipment. Liberal trade-in allowances, too, on your equipment. Write now for your free copy to Central Camera Company, Dept. 9L, 230 S. Wabash Ave., Chicago 4, (Photographic headquarters since 1899.)

BASS Says: Trading cameras a national habit since 1910. Write to Bass the old "horse trader." A postcard will do. Simply say: "Bass, I have and I want. How much will you allow me?" It's fun to trade with Bass. Satisfaction guaranteed. Bass buys, sells, and trades. Bass Camera Company, Dept. AG., 179 W. Madison St., Chicago 2.

ADD "Spice" to home projection shows with colorful old-time Nickelodeon slides. 2x2. Write for free list. Nickelodeon Co., New Fleidner Bldg., Portland 5, Oregon.

PHOTO FINISHING

FREE Roll of film with each developing order. 85c develops and prints 8 jumbos. Sent first class mail postage paid. Oxford, 3042 Greenmount Avenue, Baltimore 18, Maryland.

FAST—Same day service! 8 oversized prints in attractive plastic-bound book only 35c; 12-50c; 16-60c. Satisfaction guaranteed. Free exposure guide with first order. Pic-Sure, Box 899-B, Philadelphia 5, Penna.

NEW—16 Oversize contact prints, or 8 jumbos in album 25c. (Trial.) Album Studios, Weatherford, Okla.

8 CONTACTS 30c, Jumbos 40c, 12-45c, jumbos 55c, reprints 4c, jumbos 5c. Western Photo, Dept. PM52, Box 298, San Francisco 1, Calif.

100 PHOTOS. Same size as postage stamp, \$1.98. Gummed backs. Stick them on envelopes, etc. Made from any photo, negative or snapshot. No charge for samples. Satisfaction or money refunded. Duty free to U. S. Photostamps, 8 Bloomfield Avenue, Toronto 8, Canada.

WALLET Size photos made from negative or photo, 15 for \$1.00. Marchion Photos, Fostoria, Ohio. (Agents wanted.)

EIGHT Jumbo prints in album, 35c; 12, 50c; 16, 65c. Reprints, 5c. Free mailers. Southwestern Photo, Box 385, Tyler, Tex.

JUMBO Album prints—8 exp. 35c; 12-50c. Free mailer. 35 mm (36)—\$1.00. Flash-Photo, Box 36, Brooklyn 4, N. Y.

8-EXPOSURE Roll developed and printed, jumbo size, 40c; 12, 60c; 16, 80c. All prints in attractive memory albums. Free mailers. Crown Photo Service, Box 392B, Augusta, Ga.

JUMBO Album prints, 8 exposure roll 35c; 12, 50c; 16, 65c. Reprints 4c. Apex Photo Service, Box 197, Bronx 51, N. Y.

6 OR 8 Picture roll 35c, 12 or 16 picture roll 55c. Each roll printed and developed. Handy album pack. If you fail to get pictures on your film a new roll will be sent you without extra cost. Send coin with roll. No c.o.d.'s. Mailing containers sent free. DeLuxe Film Service, Box 1368-A, Shreveport, Louisiana.

YOUR Photo oil colored \$1.00. Copy negative 50c. Send coins. Studio, Box 94, Huron, South Dakota.

JUMBO Album prints, 8 exposures 40c; 12, 50c; 16, 60c. Photoshop, Drawer 362, Ishpeming, Michigan.

EIGHT 5x7 Or five 8x10 enlargements from four negatives \$1.00. Wilart, Box 907, Little Rock, Ark.

BEAUTIFUL Enlargement from each picture on 8 exposure roll 35c. Cut Rate Photos, Dept. B-4, Janesville, Wis.

TWO Beautiful prints from each picture on 8 exposure roll 35c. Thirty-one years of satisfied customers. Quick service. Lens Photos, Dept. J-4, Janesville, Wis.

MAIL Us your films. Prompt service. 8 exposures developed and printed 30c. Foto Art Studio, Box 406, San Francisco, Calif.

16 PRINTS Or 8 jumbos from roll, 25c with this ad. S. Skrudland, Lake Geneva, Wis.

MOTION PICTURES AND SOUND EQUIPMENT

WORLD'S Biggest selection of new and used 16mm. sound and silent films. Over 100,000 prints on hand! Everything at bargain prices. Savings of 50% and more are commonplace! Good used 16mm. sound projectors—Bell and Howells, Victors, Ampros, frequently available for as little as \$129.95. Reels, cans, supplies at bargain prices! Write today for your free copy of Blackhawk's big 24-page catalog. "Sixteen's super market." Blackhawk Films Inc., 1211 Putnam Building, Davenport, Iowa.

EXCHANGE Sound shorts, features. 50c per reel. Rons, Box 1281, Deland, Florida.

SNOW White movie screen paint. Free literature. 126 1/2 West Main, Danville, Ill.

8MM. Bargains—Blackhawk's new 8mm. catalog really has them! Films, supplies—Everything at a saving! Good used 1-reel 8mm. films frequently available at \$1.98. Blackhawk Films Inc., 1212 Putnam Building, Davenport, Iowa.

"ENTIRE Life Story of Christ" 8mm., 16mm., sound and silent, purchase or rent. Hemenway Film, 33-F Melrose St., Boston 16, Mass.

FREE Movies. Hundreds of subjects. Interesting. Entertaining. Fascinating. Latest directory, only 50c. National Cine Society, 126 Lexington Ave., New York 16, N. Y.

BARGAINS 16MM. sound films. Also for exchange. Bedner, 5300 So. Talman, Chicago.

RARE Old time movies. 16mm., 8mm. Send for list. Film Classics, 1645 N. LaBrea Ave., Hollywood 28, Calif.

CLEARANCE Sale of 16mm. films. Want a real buy in 16mm. sound films? Take advantage of the I.C.S. 1952 clearance sale of 16mm. sound features, comedies, cartoons, novelties, musicals. New, used. Send for our giant list "A" today stating machine you own (make and model). Institutional Cinema Service, Inc., 1560-PM Broadway, New York 19, N. Y.

LEARN Free lance, educational, Hollywood, and television film technique at home. State licensed. Write for free catalog. Motion Picture Institute, Birmingham 4, Michigan.

UNUSUAL 8-16MM. movies. Full-color projection length sample, \$1.00. Co/or Tru-Art slides, three samples \$1.00. Big catalog, 25c (refundable). National Film Supply, Toledo 9-H, Ohio.

5000 NEW-Used 8-16mm. silent-sound films. International, 2120 Strauss, Brooklyn 12.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue, sample film 10c. Garden Film, 317 West 50th, New York 19.

BASS Says: Leadership since 1910 guarantees satisfaction. Finest Cine equipment: 8mm., 16mm., and 35mm., silent and sound. Write the old "horse trader." Satisfaction or your money back always! Bass Camera Company, Dept. A, 179 W. Madison St., Chicago 2.

RENT 16MM. sound films. 50c reel. Large selection; free catalog. Film Service, 128 Chestnut St., Roselle Park, N. J.

GUARANTEED Fresh 8mm. roll, magazine; 16mm. roll, magazine movie films. Color. h.w. Free catalog. ESO-S. 47th Holly, Kansas City 2, Missouri.

MOVIE Camera film: 8mm. roll \$1.50, 16mm. 100' \$3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

MUSIC AND MUSICAL INSTRUMENTS

GUITAR. Learn easily, quickly, new Hollywood method. Play in 6 days. Songs included in course. Amaze your friends. Send only \$1 today. Money back guarantee. Bennett, 629 N. St. Andrews Place, Hollywood 4, Calif.

SWING Piano—By mail. 30 self-teaching lessons \$3. C.O.D. (Samples.) Phil Breton Publications, P. O. Box 1402, Omaha 8, Nebr.

SONG Writers—How to write and sell songs. Send stamped envelope for complete information or \$1 for valuable book. Your Song by famous composer-conductor. 5 day money back guarantee. Loyds of Hollywood, Dept. E, Box 407, Hollywood, Calif.

YOUR Voice made loud, clear and powerful with my diaphragm exerciser. Write. Inventor "Oz," 34V, Box 685, St. Louis, Mo.

POEMS Wanted for musical setting. Send poems for free examination. Five Star Music Masters, 630 Beacon Bldg., Boston, Mass.

LYRICS Set to music and recorded. Free examination. Cherrier Recording, 732 So. Norton, Los Angeles, California.

YOUR Words and our music. A winning combination! Send poems. Free examination. Song Promotion Guild, 350-M Broadway, New York 13.

NAME Your instrument. Lowest prices. Kaye Music, 103B Saint Marks Place, New York City.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin PM, Baldwin Park, Calif.

SONGWRITERS. Collaboration offer. Newark Publications, GPO Box 1236, Syracuse, New York.

HAWAIIAN Ukulele course (prepared by native instructor). 288 chords, 96 strokes, 12 songs. Send \$1.00 or c.o.d. plus postage. Ukulele, 1411 Irving Park, Chicago 13, Ill.

HOW A songwriting service operates. Inside secrets. Home-Study, 408 North High, Salem, Indiana.

SONGWRITERS: Hillbilly, western. Honest, outstanding offer. Dick Reynolds, Leonard 6, Texas.

MUSIC Arranged. Songs printed. Frank Wildt, Music Publisher, Lancaster, Penna.

POPULAR Songs. How to write and sell them. Write for free booklet Successful Songwriting. Gateway Songs, Box 2470, Hollywood 28, Calif.

SONGPOEMS And lyrics wanted with new and clever ideas to be set to music. Tin Pan Alley, Inc., 1650 Broadway, New York 19, N. Y.

SONGWRITERS! Protect your ideas! Hold all songs; poems! Write for Safe Correct Procedure first! Song Service, Dept. P, 333 W. 56th St., New York 19, N. Y.

POEMS Wanted. Broadcast consideration. Sooner Song Co., 22PM North West 8th, Oklahoma City 2.

SONGWRITERS! Send poems, songs. Music Service, 243 West 72nd St., PM, New York 23.

POEMS Wanted to be set to music. Free examination. Send poems, McNeil, Master of Music, 510-PM S. Alexandria, Los Angeles, California.

WRITE Songs. Big money and reputation. Write for information, J. Gordon Pub. Co., 4700 South California Avenue, Chicago.

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

ACCORDIONS—Save 50% and up. Cash or terms. New and used. All brands. Wholesale to every one. Free catalogue. Del Principe, 307 South Wabash, Chicago, Ill.

RADIO AND TELEVISION

ENJOY Color television now with 3 color celanese plastic filter screen. Thirty seconds to attach. Reduces glare, blur, and snow. Easy on the eyes. Only \$1 any size. Zingo Products, Johnstown, N. Y.

FREE Electric soldering iron, every serviceman needs one! Get full information. Rose Co., 96M Park Place, New York 7, N. Y.

BUILD 15 Radios—Only \$1.30 each. Experience unnecessary. Home Radio & T.V. Course, includes trouble-shooting and servicing lessons, radio principles, code instructions, practical radio building and repairs. You build and keep receivers, transmitters, amplifiers, test equipment, code oscillator. All parts, tools, instructions supplied including radio tester and electric soldering iron. Write for full particulars and receive absolutely free your copy of "Radio & TV Repair Guide." No obligation. Progressive Electronics Co., 497 Union Ave., Dept. PM-18, Brooklyn 11, N. Y.

HIGH Fidelity sound for your TV set. This 3 tube push-pull sound amplifier, when plugged into your TV set or radio will produce remarkable improvement in tone quality. \$14.95 C.O.D. Send check with order, save shipping charges. Vidair Television Company, 576-C W. Merrick Road, Lynbrook, New York.

FREE! 212 Page Radio-Television-Electronic Catalog! World's largest stocks, lowest prices. Complete supplies for builders, experimenters, amateurs, servicemen. Latest radios, phonos, television, recorders, sound equipment. Thousands of parts, tubes, test instruments, books, diagrams. Top quality money saving values. Get yours now! Allied Radio Corp., 833 W. Jackson Blvd., Dept. 34-E-2, Chicago 7, Ill.

6-BAY, 8-Bay antenna diagrams, testing methods, booklets—In Fringe Area Manual, \$1.00. Television Engineering Co., 303-34th, Bakersfield, California.

REPAIR Your own radios. Tells how. \$1.00 postpaid. Information free. Slate's Radio Service, Corsicana, Texas.

MAKE Simple, tubeless, batteryless, distance-getting crystal radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-P, Clinton, Mo.

TV And FM antennas. Yagi, conical, bow-tie, mounts, accessories. Lowest prices. Wholesale Supply Co., Lunenburg 1, Mass.

BUSINESS OPPORTUNITIES

MAKE Your home workshop pay up to \$6.00 hourly for your spare time. Even more with wife's help, and she'll love it! Details free. The Old House, Box 8, Spring, Texas.

INVISIBLE Reweaving—Big profit, big demand, easy-to-learn with low-cost complete course—nothing else to buy, ever. Details free, write today: Fabricon, Dept. N-4, 8342 S. Prairie Ave., Chicago 19, Ill.

"WORLD'S Shortest bookkeeping system." Copyrighted; big money to bookkeepers, whole or part time; salesmen wanted; \$3 per dozen. Mixon Company, P. O. Box 2048, Los Angeles 53.

BOOKKEEPERS, Secretaries, clerks. Operate your own business service. Earnings to \$300 week. Eleven (11) income-producing methods. For experienced or inexperienced. Details free. Commercial Business Service, Box 1974P, Greensboro, N. C.

AMAZING New patented labor-saving, precision screw-holding screw drivers! Removes, inserts screws hard-to-get-at places! Fast sales, large profits. Stores, factories buy quantities. Exclusive distributors appointed. Toolco, 90-P Summit, Brookline, Mass.

SENSATIONAL 23c Gross profit possible on new copyrighted 25c mail order item. Unworked. Proven demand. Virgin territory. Samples, dynamic mail selling plan 25c. None free. Opportunity Listing Service, Box 631-D, Liberty, Texas.

SELL Tires, big profits, no money necessary. Save users up to 50%. Biggest demand in years. Facts free. Adams Tires, 1325 E. 53 St., Rm. 503B, Chicago 15, Ill.

FISHWORM Breeding. Manual \$1.00. Guaranteed. Literature free. Haase, Kent, Ohio.

MAIL Selling opportunities galore! Free! Wehner, Box 142-A, Roxbury 19, Mass.

CO-Publish a national women's magazine that reaches 20,000 readers. Sample and details 10c. Durolyn, 7906 So. Figueroa, Los Angeles 3, California.

UP To \$200 weekly! Work home, start spare time, small capital. Free book "163 Unique, Successful Businesses" tells how. Deumant Publications, 81-M Deaument, Kenmore 23, N. Y.

MAKE 400% Profit selling "Snocones." Complete information. Snocones, P.O. Box 838, Atlanta, Ga.

MAIL Order business for sale. Reasonable investment. Plastic toys and novelties. Send \$1 for samples worth \$1.50 retail and information. Matsonian Co., Northboro, Mass.

EARTHWORMS—Raise, sell for gardens, tropical fish, frog foods, fishing. Wisconsin Earthworm Farm, Oshkosh, Wis.

FIRE Extinguishers, guaranteed; automatic. Six \$14.70. Scheall, 263X, Duluth, Minnesota.

MAKE Perfumes at home. Write, "Carey Laboratories," 1914 Chouteau PM-3, St. Louis 3, Missouri.

MAIL Literature offering fast selling books, merchandise. Details free. Maxted Book Agency, Western Springs 4PM, Ill.

OPERATE Profitable mailorder business. Free details. Nelson Novelty, Box 242-A, Bangor, Maine.

I Made a great success in the collection agency business. I can teach you too—quickly. Write me. George H. Cole, Syracuse 2, N. Y.

MAIL Order business—Your opportunity. "How To Build Your Own Mail Order Business." Beginner's idea-book tells "how." 25c postpaid. Promptly refunded if not satisfied. Albert Zimmer, 206 Central Ave., Lockland 15, Ohio.

\$5.00 HOUR! Possible! Invisible simplicity reweaving instructions. Automatic latch steel tool assembly that makes moth holes, burns, cuts, tears in clothing disappear like magic, 28 samples, 81 explanatory details. Material for life. Complete kit \$4.00. Satisfaction guaranteed, details free. Walsh, 894 Main, Buffalo 2, N. Y.

WANTED! At once! Home producers by manufacturers in our clearing house service. Become a sub-contractor casting plastic products for these companies. Thousands of easy to make items required. Cash in at home, without previous experience. For details, write Plastic Service Guild, Dept. PM5, East Boston 28, Mass.

NATURAL Molding Latex. Extra thick. Free sample. W. Wooley, 115-A Donald, Peoria, Ill.

SELL Your products by radio! No risk! Pay commission, 400 nationwide broadcasters! Simon-P-8, 48 Fifth Ave., Pelham 65, N. Y.

"HOW To Make Backyard Profits!" New folio 25c. Free details. Pickett's, Florence 1, Kentucky.

MANUFACTURE Automotive item for few cents! Retail \$1.00. Easily made! Big demand! No special tools or machinery! Belmont, Garrett 61, Indiana.

GET Dollars in your mail—Keep 90c. Everything furnished. Write, Genmerco, Box 142-P, Dorchester 24, Mass.

A \$5000-\$6000 in a year business. Keeps growing. Sewing machine repairs, trade, sell new machines, motors, etc. Necessity business every community. Free details. Taylor Service, Hamilton, PM-5, Ohio.

IMPORT-Export! Men—women. Instructions from established world trader shipped for no-risk examination. Opportunity profitable world-wide mail-order business from home without capital; or travel abroad. Experience unnecessary. Free details. Mellinger, 1715-BD, Los Angeles 24.

START Your own business on credit. Always your own boss. 1437 dealers sold \$5,000 to \$28,500 in 1950; their average \$6,704. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. E-U-PPM, Freeport, Ill.

INVISIBLE Reweaving. Men-women. Instructions shipped for no-risk examination. \$5.00 hour possible spare-full time. Reweave burns, tears, moth-holes like new at home. Free details. Skillweave, 1717-BD Westwood, Los Angeles 24.

LEARN Silk screen printing; invisible reweaving; repair dolls; make rubber stamps; repair sewing machines. Natural rubber for molds. Free sample. Universal, Box 1076-a, Peoria, Ill.

SELL From your own catalog. Hybarger, 709 E. Baltimore, Fort Worth 4, Texas.

MAKE Real money selling all-metal weatherstrip. E-Z-On, 1009 Harvard, Evanston 11, Illinois.

START Business without capital! Reliable, 15-A Park Row, New York 38, N. Y.

OUR Knowledge of mink farming. Most understandable informative book on mink farming ever written. Takes the reader every step of way in starting and operating mink farm. \$3.00 postpaid. Money back if unsatisfied. Lake Superior Mink Farm, Superior EE9, Wisconsin.

OPERATE "Escalator" mailorder system. So simple, so practical, your customers need not enclose remittance with order, nor pay any c.o.d. Yet, you actually receive conditional payment before making shipment. Easiest, most revolutionary mailorder system known. Write: Selbyco, Decatur 156, Illinois.

HOW To set up and run a mirror shop! Resilvering mirrors. Making chipped glass nameplates. Electroplating salts and rectifiers. John Sprinkle V60, Marion, Indiana.

FREE Illustrated course casting novelties genuine latex for molds. Major Chemical and Latex Co., 25 Allerton Street, Boston 19, Mass.

START A Venetian blind laundry. Profit opportunity for lifetime business. New machine method. Free booklet on request. F. C. Co., 442 N. Seneca, Wichita 12, Kans.

"MAKE Perfume" profitable mailorder business. Catalogue free. "International," 6347 Parnell PM-5, Chicago 21, Illinois.

OLD Car tires; turn them into dollars. Details free. Penn. B129ME, Embarrass, Wis.

"100 WAYS To Make Money by Mail." Write Ford, 413-K, Pittsfield 2, Mass.

YOU Can sell brand new adding machines for only \$14.95! Yes! You can sell 'em and make \$6.73 on every sale. They're executive model portables, precision built, fully guaranteed. For life size color photo and all details, write to Lightning Adding Machine Co., Inc., Dept. P-17, 1260 West Second Street, Los Angeles, Calif.

SOURCES "Million Items wholesale." List free. Cottage Industries, Omaha 12, Nebr.

TIN-Cans. Turn them into cash. Nine methods. Instructions 50c. Charles Company, 12-DAC, Norwood, Ohio.

EXTRA Profits in paint and upholstery cleaning. New Zipp-reme portable spray method. Spray and wipe off—that's all! Cuts grease like a razor. Schools, churches, hospitals, taverns, clubs, car dealers, homes, etc. Outfit \$85.00 less 1/4 H.P. motor. Write Zipp-reme Chemical Co., Greensburg, Penna.

EARN Extra money, spare time. Write, Chamberlain, Box 894, Manchester, New Hampshire.

\$15,000.00 YEARLY Possible with surplus comic books. New, fascinating. Particulars and sample 25c. Kenneth Fleck, Columbia City, Indiana.

LEARN Mail order business. Little capital. Sample copy 10c. Main, 157 Britannia, Hamilton, Canada.

FIX Typewriters. Free booklet describes our modern, inexpensive home-study course. Factory methods taught. Write: Typewriter 3915 Corbet, Tarentum, Penna.

START Home mailorder business. Details. Gedgard, Box 798-H, New York 1, N. Y.

FREE Booklet "How to Raise Worms for Bait." Tells how to propagate, package, sell. El Sobrante Earthworm Farm, 749-A Rincon, El Sobrante, California.

SAWDUST. Turn it into cash. Twenty methods. Instructions 50c. Charles Company, 12-DAB, Norwood, Ohio.

LITTLE As \$10 starts your business; local or mail order; 50 different kinds. Natmerch, Box 1975-AE, Little Rock, Ark.

EARN Money at home with your typewriter! Spare time! Details free. Edwards, Publisher, 3915-PM, 12th, Des Moines 13, Iowa.

MAKE Big money at home repairing Ponson and Popular lighters. It's easy. Details free. Lighterhouse Parts Manufacturers, Blaine, Washington.

START Your own mail order business with hundreds of live repeat hobbycraft items. No stock to carry. We pack and ship for you. Send dime for details. Write Dept. PMX5, Mail Order Service, 845 S. Wabash, Chicago 5.

GET Newest, best home mail business offers featuring fast-selling books; merchandise. Everything furnished. Hickory Lane, East Kingston 7, N. H.

MAKE Rubber floors, flexible molds, plastic rubber from tire recappers' waste. Easy! Profitable! Instructions and samples \$1.00. Satisfaction guaranteed. Cesten Products, 242R, Crozet, Va.

POOR Boy's chance. Big income; start from small backyard. Complete plans, \$1.00. Kramers, 1309 South Cheyenne, Tulsa 14, Oklahoma.

PRINT Without a printing press. Posters, banners, greeting cards, toys, glassware, neckties, anything! New easy revolutionary method. No special equipment or experience needed. Work full or spare time at home. No selling. We set up your own local business. Wonderful money making opportunity. Free sample. Profitable ideas, beautifully illustrated plan free. Write: Screen-Print, 1010-M Los Angeles Street, Los Angeles 15.

START A home business in spare time. Make extra money. Experience not essential. Literature free. Chas. Stephenson, St. Marys, West Virginia.

MAKE And sell nameplates, house numbers, flasher signs, Crabtree, Newport News 221, Virginia.

HOME Mailorder business. Pays well. Literature free. Variety; 57 Circuit, Newton Highlands 61, Mass.

MAKE Money at home as renewal headquarters for all magazines. Liberal commissions. No experience. No capital needed. Supplies furnished. Write for free catalog. McGregor Magazine Agency, Dept. 500B, Mount Morris, Ill.

\$5 AN Hour and more possible in your home. You can paint it with suede. Fabulous new business. Spare or full time. Spray on rainbow colors. Auto dashboards and trunks, signs, radios, toys, figurines, lamps, etc. Beautified with amazing new 3rd dimensional plush-like finish with touch-appeal as well as eye-appeal. I'll send you complete, step-by-step plans and equipment, including high-velocity spray gun for no-risk examination in your own home. Send no money, just name and address. Coast, 1004-AM S. Los Angeles St., Los Angeles 15.

TRADE Magazines help you to success. Get latest copies through our easy-to-get-acquainted service. Hundreds of business, professional, craft, laundry, legal, lumber, machinery, mail order, marine, metal, military, milk, milling, motion picture, automotive, construction, electrical, food and others covering all interests. Send for list today. It's free. Commercial Engraving Publishing Company, 34C North Ritter, Indianapolis 19, Indiana.

WATERLESS Hand cleaners. Highly profitable home mfg. and route business. Simply add water to concentrates, or ready-packed under your label. Dispensers at cost. Western B Aircraft, Los Angeles 19.

MAKE Money spare or full time, casting metal toys and novelties. Big wholesale and chain store demand for cast metal autos, soldiers, ashtrays, banks, etc., keeps manufacturers busy. Production molds furnished for up to 100 and more castings per hour. No experience or special place necessary. Write for information and illustrations of patterns needed. Metal Cast Products Co., Dept. A, 1696 Boston Road, New York 60, N. Y.

START Home manufacturing business. Make cleaners, soaps, polishes, cosmetics. Free literature. Kemix, Park Ridge, Ill.

LIQUID Rubber, make flexible molds. Free sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

MAKE Tough, durable plastic—1c pound. Makes attractive floors, walls, built-ins, roofs. Build good home, \$150.00 room. Bays Laboratory, Oklahoma City 9.

LIQUID Molding rubber, \$2.95 quart, \$9.95 gallon prepaid! Plastercraft Supply Company, 3051 St. Clair Ave., Cleveland 14, Ohio.

WHY Not make extra dollars repairing zippers? Excellent profits, uncrowded field. Details free. Texas Specialty Company, 204-B Texas, Texarkana, Texas.

SAVE Profit—Buy thousands nationally advertised articles direct from manufacturers. Literature free. E. L. Gray, Box 458, Tombstone, Arizona.

RAISE Fishworms easy. Profitable. Complete instructions 25c. Huffman's Worm Ranch, Rives Junction, Mich.

GET Smart, buy fast selling items, wholesale. 1130 Broadway, New York.

YOUR Name and address on postal will bring many local and mail business opportunities. Apex Supply, Box 165, New York 18, N. Y.

PROFITABLE Home business. Electroplate novelties, autoparts, mirrors, baby shoes, etc. Portable Tyco electro-plater \$5.95, including plating salts, formulas, instruction manual. Free booklet, Tyco Metals, Box 13231-MF, Houston 19, Texas.

WHY Job worry? Start electroplating, metal finishing business. Free information, trade secrets. Plater M Hyde, 327 West 120th Street, Los Angeles 61, California.

MAKE Money at home doing light-easy mailing work. Everything furnished—Orders filled for you. Charles, Box 32, New York 63, N. Y.

HOME Business opportunity mailing literature to new mothers. Everything furnished. Big earnings. Orders filled. Delray, Box 3852M, Columbus 13, Ohio.

FIGURINE Molds and many others, liquid rubber, statuary plasters, flock finishes, Glo-candle wax, etc. Illustrated catalog and "Plastercraft" manual free. Blue Rapids Supply, Blue Rapids, Kansas.

LEARN The truth about mail order business from beginners standpoint. Send 25c for "eye opening" booklet. Satisfaction guaranteed. E. Black, Box 5, Maiverne 1, New York.

START Mail order bookshop—Profits to 70%. Profitable future. 25c brings booklet, samples, exciting ideas. General Publications, Ossining, N. Y.

NEW Exceptionally profitable plans, ideas for home operated mail business. Rush name. Miller, 1773-P Carlyon Road, East Cleveland 12, Ohio.

DISTRIBUTORS Wanted. Aluminum awnings. Big profits. Big demand. Make your own. Everything supplied. Details free. Kramer Industries, 321 S. Anita, Los Angeles 49, Calif.

START Home mailorder business. Sell books, folios, merchandise. Circulars furnished. Sample folio, 20 imprints, dime. Siegel, Box 84, New York 12, N. Y.

MAKE Flexible molds! Cast plaques, bookends, figurines! Free sample! H. Tooker, 630-R Chestnut, Hamilton, Ohio.

\$200 WEEKLY Reported! No selling. Free booklet. T. J. Surface, Roanoke 4, Virginia.

QUICK Sign painting. Use letter patterns, avoid sloppy work, wasted time. Write for sample. John Rahn, A1330 Central, Chicago 51.

LEARN Moldmaking, plaster casting. Profitable home business. Details free. Hobby Shop, 410 S. Detroit, Toledo, Ohio.

21 POPCORN, Candy apple formulas, proven money-makers. Send \$1 today for formulas, catalog of money-making ideas. Concession Supply, 3916 Secor, Toledo, Ohio.

RUBBER Molds! New catalog illustrating over 100 professional molds, 10c. Castcraft Studios, 508-P Marion St., Brooklyn 33, N. Y.

RECAST Old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

READ "Advance"—The voice of mail order. Offers money-making opportunities, sources of supply, personal guidance, etc. Issued monthly. Sample copy 35c. Yearly subscription \$2.00. Advance Publishing Company, 313 East 21st Street, Suite 450, New York 10, N. Y.

MAKE Money sharpening saws and lawnmowers. Start at home. Free book, "Money Making Facts," tells how. Victor Foley Company, Columbia Heights, Minn.

COLOR Concrete with chemicals. Marble-glaze cement benches, pottery, garden ornaments. Home-shop, 10c brings sample, pictures. Hollywood Cementcraft, 8527-R Wonderland, Hollywood 46, Calif.

TO \$35.00 Weekly. Spare time, home operated mail order business. Successful small "beginner's" plan. Everything supplied. Lynn, 10420-M National, Los Angeles 34, California.

BOOKKEEPERS—Earn \$5000 yearly part time. Sell, operate new sensational CPA bookkeeping service. Kern, 4942 Vineland, North Hollywood, Calif.

GOOD Paying business silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required. Outfit furnished. Free booklet. Gunmetal Co., Ave. H, Decatur, Illinois.

137 WAYS To make money, in home or office, business of your own. Full particulars free. Elite Co., 220 Grand St., New York 13.

SELL By mail, free details; instructive booklet 25c. Manhattan House, Box 51-M, St. Albans 12, New York.

1001 OPPORTUNITIES Club. 1495 Westchester Ave., New York 72, offers real money making ideas. Free information.

MAKE Gifts, novelties, jewelry, from sea shells, fish scales, plastics. No tools needed! Learn secret methods of bronzing, pearlizing, golding, silvering, metalizing, luminizing, dyeing. Write! Giftcrafts, Box 4550-PM, Coral Gables, Florida.

POPCORN And potato chip equipment. Long Eakins Company, 5260 High, Springfield 99, Ohio.

BUY Wholesale. Thousands articles. Supply directory, 10c. Idealco, Park Ridge, Illinois.

ESCAPE Wage slavery. Easily. Operate your own profitable lifetime business. Free literature, Corley, R285 Carlton, East Rutherford, New Jersey.

EARN Extra money! "Homeworker Magazine" tells how. Sample 25c. Sizemore, Box 7, 4917 Kostner, Chicago 30.

VENDING Machines earn big money! An investment as low as \$10.50 will start you in this fascinating, profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our free catalog illustrating our nut, candy, gum and stamp vendors; also pin ball machines, music boxes, etc. Write immediately to Parkway Machine Corporation, Dept. 7, 715 Ensor Street, Baltimore 2, Maryland.

BE Listed to receive latest mail order offers, samples, propositions. National, Box 58-P, Dorchester 22, Mass.

BOOKKEEPERS. Keep books, small firms spare time. Manual latest technique by C.P.A., \$3.00. Modern Business, Box 466, Youngstown 1, Ohio.

FREE Book "505 Odd, Successful Businesses." Work home! Expect something odd! Pacific, Oceanside, Calif.

\$46 FROM Square foot plywood; jig saw necessary. Write: Woodarts, Bridgewater, Mass.

EXTRA Money—No selling, operate vendors. Amazing profits, details free. Silver King, Suite 220, 622 Diversey, Chicago 14.

BUY it wholesale! Manufacturers, distributors offer 850,000 items. Literature free. Oisen, 1231-A East Third St., Duluth 5, Minn.

\$25 WEEKLY Working two hours daily. No canvassing. No manufacturing. Lycke, Box 2471-A, Cleveland 12, Ohio.

HOW And where to obtain capital, details free. Star Service, Wapakoneta, Ohio.

EARTHWORM Breeding? First, get unusual story. "An Earthworm Turned His Life." Free. Earthmaster, Dept. 14, El Monte, Calif.

MONEY In new greaseless doughnuts. Start in kitchen. No smoke. Sell stores. Free recipes. M. Ray Company, 3605 South 15 Ave., Minneapolis 7, Minnesota.

INCOME From local information. No selling. Write Neherco, La Verne, Calif.

UNPAINTED Bookends, plaques, statues, figurines. List. Haverty Products, 822-17th St., Altoona, Penna.

OPERATE Profitable mail order business. Write Walter Service, 4159-A East 112th, Cleveland 5, Ohio.

DOLLARS In personalized baby record books. Sell by mail. Use same literature we do. No-Co-Ro, Oakland 6, Calif.

FABULOUS Earnings—Fascinating pastime. Growing genuine, living miniature (ming) tree. New sensational business or hobby. Astounding information free. Dwarf Gardens, Box 355B, Briggs Station, Los Angeles 48, Calif.

MADE \$24,500 Using money making plans from Schemer Magazine, world's oldest mailorder publication. Box 275M, Canfield, Ohio. Year \$2.00. Sample 20c.

MINK Raising information free. Complete. Lake Superior Mink Farm, Superior, E.E.I., Wisconsin.

COPUBLISH Leading m.o. paper. Latest copy Mail Sale Advertiser, details, dime. Vanroy Shirk, Lebanon, Penna.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries Company, Grand Rapids, Minnesota.

MONEYMAKING OPPORTUNITIES

EARN Money evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle 1, Wisconsin.

GROW Dwarfed trees! Pot, sell. Instructions, 25c. Levy, 4610 Dumaine, New Orleans, La.

FREE Nationwide advertising, publicity! Advertise your products to 51 million readers thru 77 national magazines, free of charge! Broadcast on 400 radio stations without risking a penny! Send 25c (refundable) for details today! Treasury, 149 Storer, New Rochelle 6-L, New York.

UP To \$25 weekly assembling costume jewelry at home. Send 10c for complete money making plan. Gemcraft, 1812C E. 13 St., Cleveland 14, Ohio.

TIE-Breakers for D.A.V. American puzzle contests exposed. Manual \$5.00. Satisfaction guaranteed. D. Wenograd, Box 1495, Philadelphia 5, Penna.

I Make 800% profit on small item. You can too. Sample, source and 200 mailorder plans, tips, sources \$1. Contax, 6621 Bishop, Chicago 36.

EARN Sparetime money. Literature free. Booklet 30c, Box 48, Brooklyn 25, N. Y.

\$40.00 WEEKLY Possible at home in spare time. Write Vennard's, 333 North Michigan, Chicago 1.

SCHUHMACHER Matmakers. Convert old tires into dollars. Devote full or spare time. S and S Patents, Inc., 1307 North Clark St., Chicago 10, Ill.

MAIL Order profits! Leading trade magazine (published 20 years) shows you how! Sample copy, 10c. Pioneer, 4303 Highview Avenue, Baltimore 29-C, Maryland.

SELL By mail, everything furnished. Write Paragon, Box 2194, Houston, Texas.

OLD Phonograph records wanted. Pays up to \$300. 1500 listings and instructions \$1.00. National Associates, 1264-M North Harper, Hollywood 46, California.

MAIL Order opportunities. Send 25c for magazines "Progressive Mail Trade" and "Tip Top Salesman," plus our latest wholesale catalog of toys, novelties, etc. Gerlach, Box 245, Sheboygan, Wis.

MAKE Money addressing and mailing postcards. Write Ernest Martin, Preston, Va. Addressed envelope appreciated.

DECORATE Autos for weddings. Amaze friends or start business. Instructions one dollar. Jacobs, Gardenville, Penna.

SELL Diamondite gems. 10% more brilliant than expensive diamonds. New scientific discovery. Only \$9.75 carat, wholesale. Guaranteed. Make \$50.00 day. Free information. Diamondite Gem Co., 1404-M Mitchell Street, Oakland 1, Calif.

MAKE Money in your back yard. Send \$1.00 for Plans to Profits, P.O. Box 633, Sheboygan, Wis.

TREMENDOUS Profits selling news clippings, advertisements. Complete folio, \$1.00. Opportunities, 1414 Hammond, Superior, Wis.

WIN Contest money. General Contest Bulletin gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609½ East 5th, Duluth, Minnesota.

SHEEREST Nylon hosiery, 60/15, first quality \$8.75 dozen f.o.b. Brownsville, Texas. Robert Celaya.

"HOW To Make Money With Hobbies." Free folder. Campbell, Bealeton 1, Virginia.

FREE! Moneymaking opportunities galore including magazines. Wilbur Erickson, Englishtown, New Jersey.

1000% PROFIT. Can't fail system. Free particulars, or, for quick start invest \$1.00. Money back guaranteed. Honest Deal, Box 6421, Philadelphia.

HIGH School men—Splendid opportunity to earn money this vacation. Write Box 154, Oakland City, Indiana.

50,000 ARTICLES Wholesale. Source directory, dime. Nelko, Box 3462-DR, Chicago 54.

FREE Book "505 Odd, Successful Businesses." Work home. Expect something odd! Pacific, Oceanside, Calif.

BE Appointed State Notary Public now! Details: Stationers, Helotes, Texas.

PUBLISH Your own magazine. Hand-some 52 page format, well edited, illustrated. Cost low as \$1.00 month. Brings you prestige, profits. 25c brings sample, details. National, Ord, Nebr.

READ Progressive Mailtrade, the magazine that tells how to make money by mail. Dime brings sample and special offer. Progressive Mailtrade, Box 357, Sheboygan, Wisconsin.

FORMULAS, PLANS, ETC.

500 FORMULAS \$1.00. 10,000 formulas \$4.00. N. Green, Corinth 8, New York.

10,000 FORMULAS, Processes, trade secrets, etc. 900 pages, \$3.98 postpaid. K. Paulin, Loudonville, Ohio.

REAL Manufacturing formulas. Lists free. Cummings, Chemist, Gordon Ave., Syracuse 4, N. Y.

FORMULAS: All kinds. Latest, best. Literature free. Kemixal, Park Ridge, Ill.

TESTED Formulas. Interesting descriptive booklet free. Pont. Box 635-PM, Terre Haute, Indiana.

HOT Tamale making for profit. Particulars. Write F. E. Skinner, 419 W. Live Oak, Altus, Okla.

FREE Formula catalog. Anything analyzed \$25.00. Western Chemical, Salem, Oregon.

PLASTICS

PARATOL Supreme "706-G" Molder. Newly developed compound. The toughest rubber ever made for molding purposes. Supreme molds, precision reproductions, double strength. For the operator who wants the finest. There is no substitute. Direct to consumer prices: \$3.00 per quart, 1 gal. cans \$9.00, 5 gal. cans \$8.75 per gal., 4 oz. samples 50c to cover mail handling. U.S.A. only. Testworth Products Corp., Dept. B, P.O. Box 482, Itasca, Ill.

NEW Liquid casting plastic. Clear, colors. Embed flowers, insects, coins. Saw, drill, carve. Send 25c for wholesale catalog and new sales manual showing how to make money at home. Castolite, Dept. E-101, Woodstock, Illinois.

HOME Repair kit. Mends all plastic articles. Quick, easy, professional results. \$1.00. Free information. Plastic Industries, Box 1138, Santa Fe, New Mexico.

LEARN Plastics at home. Small cost—Spare time. Dime brings sample plastic, three experiments, full details. Plastic Projects, Box 5151, Detroit 35, Mich.

PLASTICS Catalog—10c. Sheets, rods, tubes, molding, casting plastics. Information, bargains galore. Sample low price: 1/16" clear Lucite, full sheets, 98c square foot. (36"x48"). Gem-O-Lite, Box 686G, North Hollywood, Calif.

LUCITE Plexiglas. Any size sheets, masked. Square foot (12 x 12) cost, 1/16", \$1.20; 1/8", \$1.40; 3/16", \$1.75; 1/4", \$2.08. Include 10% postage. Almac Plastics, 230 Fifth Ave., New York 1, N. Y.

PLASTIC, Sheets, rods, tubes, etc. Free list. Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 7, Mo.

MANUFACTURERS Of a complete line of internal carvings. Crystal Floral Company, Bound Brook, New Jersey.

CHEMISTRY

CHEMICALS, Supply catalog 15c. refundable. Laboratory Sales, Box 161-A, Brighton, Mass.

SPECTROSCOPE For quick chemical analysis \$3.00. Kutting Sons, Los Altos, Calif.

OH Boy! New book of science. Experiments, formulas, secret processes, together with catalogue of laboratory supplies, only 25c. National Scientific Company, Dept. 16, 2204 W. North Avenue, Chicago 47, Ill.

BRAND New, spectacular chemical and fireworks manual. Complete set-ups and instructions \$1.00. Chemi-Technix Laboratories, 568 Riley, Buffalo, New York.

CHEMICALS And apparatus for industrial, analytical, and private laboratories. Catalog 20c. Dept. M-50, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 26, N. Y.

NEW Idea chemical and apparatus outfits for home experimenting. Photo-scales, microscopes, chemicals, biological and laboratory supplies in small quantities. Catalog 25c. Established 1931. John H. Winn, 124A West 23rd Street, New York, N. Y.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology, 10c. Tracey Laboratories, Evanston, Illinois.

HELP WANTED

EXPERIENCED Saleswomen to represent high calibre Hawaiian sportswear manufacturer. Unusual creations for women. Momi Sportswear, Mfg., 350 North King Street, Honolulu, Hawaii.

AGENTS WANTED

PHOTO-Salesmen, agents. Sell beautiful hand colored plastic enlargements and sensational new photo compacts, rings, bracelets, lockets, etc. Collect deposit, we deliver. Profitable sideline. Send card for free sample kit. Novel Portrait Co., 3343 North Ave., Chicago, Ill.

AMAZING Miracle auto polish — Plaston! New scientific discovery contains pure carnauba wax, genuine plastic plus silicones! Sensational money maker! Nationally advertised! Sold by leading firms. Used by America's largest organizations. Only \$1 retail. 100% profits. Sales experience unnecessary. Exceptionally easy sales. High repeat sales. Choice protected territories. Once in a life time opportunity for large steady earnings. Only limited number of agents accepted. Write today, Plaston Company, 2950 W. Grand, Dept. PM-5, Chicago 12, Illinois.

ATTENTION: Draftsmen, engineers, architects, and designers. We have limited openings for agents in drafting and engineering departments to take orders on drafting supplies. Attractive discounts and commissions. Excellent opportunity. Write P. O. Box 968, Hartford 1, Conn.

MAKE Wedding profits. Sell invitations, napkins, matches. Samples free. Dunbar's, Middlebush 3, N. J.

We have the item that has been nominated the sales leader. Free catalog. Select Shaker Co., 5132 Shattuck, Oakland, Calif.

HUGE Profits. Assemble rhinestone jewelry. Sample kit \$1.79. Sells for \$6.50. Giant 70 page idea packed wholesale catalog only 20c. House of Hobbies, Dept. 1A, Evanston, Ill.

BUY Wholesale thousands nationally advertised products at big discount. Sent free "The Wholesale Plan." American Buyers' Service, 629-R Linden, Buffalo, N. Y.

DU Pont nylons. Mill prices. 100% profit. Satisfaction guaranteed or your money back. Details free. Write today, Arch Hosiery, 104 N. 5th St., Philadelphia P6, Penna.

ULTRA-Blue stock signs—7c, sell 50c. 2000 slogans. 7" x 11", comedy, religious, general. 15 samples, \$1.00. Lowy, 812 Broadway, Dept. 670, New York 3.

AGENTS, Earn large profits on perfumes, toiletries, low wholesale prices, write: Georgia Gay, 4229 Cheltenham Ave., Philadelphia 24, Penna.

CALENDARS, Advertising novelties, matches. All styles, including religious, varnished, 12 sheet, girls. Hundreds of advertising novelties, book matches, etc. Fleming Calendar Co., 6539 Cottage Grove, Chicago 37, Ill.

FREE Samples, and amazing plan, giving you gorgeous dress without penny cost. Rush name today with dress size. Hartford, Dept. G-635, Cincinnati 25, Ohio.

NEW Plastic mending tape. Just press on! Repairs clothing instantly. Lightning seller. Samples sent on trial. Kristee 147, Akron, Ohio.

BUY Wholesale — 25,000 items. Catalogue 25c. Matthews, 1472-B10 Broadway, New York City.

BEST Source for nylons. Fields Hosiery, 99-D Chauncy St., Boston, Mass.

MEXICAN Feather pictures. Sell on sight; 200% profit! Free details. Sample 20c stamps. (No coins). Sylvap, Apartado 9036, Mexico City.

WHOLESALE Catalog appliances, toys, watches, etc. 25c (refund first order). Cam Company, 1717 58th, Brooklyn 4, N. Y.

MEXICAN Feather pictures. High profit! Fast sellers! Adelphi, Box 57-B, Bellerose 6, N. Y.

MAKE Money every day selling "Oxford Tie Rocks." Smartly styled chrome plated steel and rich walnut finish, wood construction, amazing. Holds 36 ties individually in 9" space. James Products, 1625 So. 50th Ave., Cicero, Ill.

BIG Profits! Sell new, factory guaranteed watches—Benrus, Bulova, Elgin, Gruen, Hamilton, Longines. Write, Standard, 1541 North Fuller, Hollywood, Calif.

WANTED! Men-women, to sell new, different specialty to homes and business places. Big earnings full-part time! Rush name for complete offer. Brady Specialties, Dept. A, 255 West 34th Street, New York 1, N. Y.

BE A money maker. Use your home as magazine headquarters. Liberal commissions. No experience. No capital needed. Everything furnished. Write for free catalog. McGregor Magazine Agency, Dept. 500A, Mount Morris, Ill.

HOUSE Paint — Wholesale price \$2.85 gallon. Private label. Big profits. Certified Products, Louisville, Ky.

AMAZING But true! We pay you daily cash for giving women privilege wearing wonderful nylon stockings at our risk. These beautiful sheer nylons cost nothing unless satisfactory! Yet, you get advance cash plus huge bonus that increases your earnings by 40%. Postcard brings you free sample stocking and complete money-making outfit. No obligation. Kendex, Babylon 83, N. Y.

DISHWASHER. Amazing invention. Portable. Fits kitchen drain board. Washes, rinses, air dries in minutes. No installation. Low priced. Guaranteed. Housewives wild about it. Great money maker. Literature free. Bessen Co., 522 Main, Evanston, Ill.

BIG Profits selling ties (\$2.00 values.). \$6.50 dozen. Free catalog. Empire Cravats, 648 Broadway, New York 12.

GOLD Lacquered and silver sign letters. Windows, doors, trucks. Standard sizes. Penny and up samples. Atlas-P, 544 West 79th, Chicago 20.

YOUR Own business—Used suits \$1.50; topcoats 50c; shoes 12¹/₂c; ladies' coats 30c; dresses 10c. Enormous profits. Catalog free. Moro, 558-AA Roosevelt, Chicago 7.

MAKE Tremendous profits with fast-selling costume jewelry! Buy direct! Sell your friends, neighbors and customers at big savings to them! Write for our free catalog! Penn Jewelry, Dept. P, 826 W. Lacka., Scranton, Penna.

CALIFORNIA Sweet smelling beads. Sensational sellers. Free particulars. Mission, 2328PM West Pico, Los Angeles 6, Calif.

PRINTING—Salesbooks, envelopes, tags. Free illustrated catalog. ErSCO, Bronx 72, N. Y.

\$50 WEEKLY Selling finest razor blades, other items. Free details. Edisons, Box 274, Far Rockaway, N. Y.

GUARANTEED 200,000 Mile ring, valve job! Restores compression! Stops oil pumping! Send \$3.00 for \$6.00 package and sales offer! Nerlino, Box 7, Inglewood 5, Calif.

NEED Extra cash? Take orders for personal initialed belts and buckles, cap badges, tie holders, etc. Choice of 3000 emblems. Free sales kit. Hook-Fast, Box 1425PM, Providence, R. I.

EXCELLENT Sideline for printing and advertising salesmen. Decalomania name plates in small quantities. Great demand. Also, make money with our line of automobile initials and sign letters. Free samples. "Ralco" XL-Roxbury, Boston 19, Mass.

AGENTS: Stamping names on key protectors. Sample 25c. Stamping outfits, checks, social security and name plates. Hart Mfg. Co., 303 Degraw St., Brooklyn, N. Y.

AGENTS — 300% Profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 438-B North Clark, Chicago.

SELL Big money-maker to men and women. Easy handwork makes fast-selling useful articles. Sunmade Company, Brockton 64, Mass.

SALESMEN. Distributors, fast selling costume jewelry direct from factory. Big picture catalog, free. Pickcraft, M19 Bank, Attleboro, Massachusetts.

BE The Popular Mechanics representative in your neighborhood and earn big profits in your spare time. Write Popular Mechanics Magazine, Room 408M, 200 E. Ontario St., Chicago, Ill.

HIGH-GRADE SALESMEN

IS \$210 A week worth a postcard to you? Then rush card with name and address for special free trial plan that sells amazing new automatic refrigerator defroster "like hot cakes!" Write to Mr. Lewis, D-Frost-O-Matic Corp., Dept. H-102, 173 W. Madison, Chicago 2, Ill.

WANT To make real money? You can positively make \$50.00 a day and up selling a brand new item going to every type of food and beverage store, factories, laboratories, hospitals, etc. First time advertised. Samples furnished. Utility Dura-wear, 53 West Jackson Blvd., Dept. PM-5, Chicago, Illinois.

MAKE Big money—Season starting. Sell 1953 calendars, advertising specialties and executive gift line. Experience unnecessary. Commissions advanced. Outfit free. North American Calendar, 805-AA Washington, Chicago 6.

MIRACLE Glaze. Amazing car luster. Free sample. Big commissions. Miracle Glaze Company, 9714 Austin, Oaklawn, Illinois.

MAKE Money showing neighbors how to keep leaves out of gutters with new invention. Steele Mfg. Co., 445 Winchester Ave., Ashland, Ky.

ADVERTISING Book matches—Cash in on big demand; sell union label matches. Cuts for all businesses and political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. M-552, 7530 Greenwood, Chicago.

\$100 WEEKLY. Power mowers. Wholesale deal. Guaranteed sales. Rotacut-51, Excelsior Springs, Mo.

SALESMEN: \$100.00 More weekly on present job using "amazing secret." Postcard brings startling information. Brennan, 4025-C Lankershim, North Hollywood, Calif.

AD Matches! Sell amazing designs—20, 30, 40 and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part time. Buy nothing! Sales kit furnished. Match Corp., Dept. PM-29, Chicago 22, Illinois.

WRITE 3 Words—Collect \$7.65 on 10-second demonstration to merchants. Write on glass with amazing magic crayon—Presto! 5 color advertising message takes fire, glows like brilliant neon. Three sales daily bring \$22.95 profit. Rush postcard for details. Complete sales kit, free! Maxlume Co., 125 W. Hubbard, Dept. CL-8-E, Chicago 10, Illinois.

SELL Degreasing solvents to automobile dealers, garages, repair shops. Nice income, steady repeater, exclusive territory. Donn Chemical, 1417 East Sixty-First, PM, Chicago 37.

SALESMEN—Get happy! Hundreds different things to sell; all details free! Write what you sell now; what you'd like to sell. Your mail box will run over! Salesmen's Service, Drawer 8711, Fort Worth 12, Tex.

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 28 E. Jackson, Dept. 17, Chicago 4, Ill.

EDUCATIONAL AND INSTRUCTION

BE A real estate broker through home study or classroom instruction. Write for free book. Approved for Veterans. Weaver School of Real Estate, Suite 360 Law Bldg., Box CP-5, Kansas City, Mo.

WANT A diesel job? New opportunities to increase income. Higher pay. More money. We can help you qualify. Tools. Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division, Interstate Training Service, Dept. 3E, Portland 13, Oregon.

"HOW To Break and Train Horses"—A book every farmer and horseman should have. It is free; no obligation. Simply address Beery School of Horsemanship, Dept. 1105, Pleasant Hill, Ohio.

INVESTIGATE The collection agency business. Highly profitable. Easily learned. Free folder. Cole Associates, Syracuse 2, N. Y.

MAKE Up to \$45-\$55 week as a trained practical nurse! Learn quickly at home. Booklet free. Chicago School of Nursing, Dept. M-5, Chicago.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" bookkeeping and tax service. Full or spare time. Details free. No obligation. Ellis, Box 200-E, Cedar Grove, North Carolina.

HIGH School—No classes. Study at home. Spare time. Diploma awarded. Write for free catalog HF-20, Wayne School, 2527 N. Sheffield, Chicago 14, Ill.

WELDING Training pays at Hobart Welding School, Box M-522, Troy, Ohio. VA contract. Best equipment. Catalog free.

USED Correspondence courses bought and sold. List free. Walsh, 894 Main, Buffalo 2, N. Y.

BOOKS, Magazines, courses — Bought, rented, traded. John Skane, Elizabethville, Penna.

SAVE Algebra worry. New, analytic method teaches quadratics instantly. Rush \$1. Guaranteed. Ziembak, 6123 Orchard, Dearborn, Mich.

DRAFTING—Learn easily at home. Monroe Institute, PM-5, Alton, Illinois.

BECOME A Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of Ph.D. or Ms.D. Solve mental worries. Free book. College of Universal Truth, 5153-C North Clark, Chicago.

3900 LATEST Used correspondence courses. Cat. \$1.00. 3 cartoonist courses \$3.95. EG, Elmsford, N. Y.

A College degree by home study. B.A. and M.A. degrees. Previous credits recognized. Remain employed and still attain a college education. Low cost, pay-as-you-learn plan. State chartered. Fremont College, Santa Fe 45, New Mexico.

LEARN "What's Wrong With Your Service Station." Full information, \$2. Service Station, Box 5403, Dallas, Texas.

CORRECT Your speech defects at home. Complete instructions \$1.00. John E. Thompson, Gastonville, Penna.

MIDLAND Linotype School, Charles City, Iowa. Civilian and Veteran Courses. Free placement. Established 1909.

PROFIT From secrets of Eastern Wisdom. Learn Yoga at home. Become physically fit, mentally dominant, financially independent. Send 25c for first lesson. Insight School, Dept. PM, 1144 Ashland, Evanston, Illinois.

UNIVERSITY Degrees by residence and correspondence. Golden State University, Hollywood, Calif.

HOME Study course, drugless therapy. Free literature. Institute of Drugless Therapy, Tama, Iowa.

LEARN Priceless secrets of technical metaphysics. Easy. Simple. Write Canada School of Technical Metaphysics, 2532 McKenzie St., Vancouver, B. C., Canada, for amazing information.

OWN A collection agency. Big money. Franklin Credit, Roanoke 7, Virginia.

HAPPINESS, Success, money. All these can be yours. Know thyself. Send for free analysis chart. Sullivan Institute, 541 North 89th St., Milwaukee 13, Wisconsin.

88-15,000 YEARLY Not unusual for Acme-trained tool and die designers! Industry desperately needs competent men. You can learn quickly by easy home study. No art ability required. Acme graduates go farther faster in tool and die designing. Famous "Cope" system includes same methods and texts used by our resident schools to train tool and die designers. Write today for free literature. Acme School of Die Design, 8 N. Jefferson Street, Dayton 2, Ohio.

MEDICAL Laboratory technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-J, Austin, Texas.

USED Correspondence courses and books sold and rented. Money back guarantee. Catalog free. Courses bought. Lee Mountain, Pisgah, Alabama.

PIANO Tuning pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—53rd year. G.I. approved. Write for booklet. Niles Bryant School, 78 Bryant Bldg., Washington 16, D. C.

SECRET Investigation. Experience unnecessary. Investigators particulars free. George Wagner, M125 West 86th, New York 24.

INVESTIGATOR Training. Phillips Secret Service System, 1917-B North Kenneth, Chicago 39.

PLAYS, STORIES, MANUSCRIPTS

BEGINNING Writers: Let us show you how to get \$1 to \$20 checks in your daily mail doing simple spare time writing. Experience unnecessary. Details free. W. Herwell, 7016 Euclid, Cleveland 3, Ohio.

MUSICAL Comedy plays. Dorby Publications, P.O. Box 131, Brier Hill, New York.

I Want new writers to cash checks of \$1 to \$100 offered daily. The easiest way to write for pay. No previous experience necessary. Free details. Saunders M. Cummings, 463-11 Independence Bldg., Colorado Springs, Colo.

BUSINESS SERVICE

REMAIL Forwarding service from New Orleans. Commercial, private. 25c each, \$4.00 monthly. Sinclair, Box 762, New Orleans 2, Louisiana.

SPECIAL SERVICES

LETTERS Remailed 25c each. Jones, 491 Sherbourne, Toronto, Canada.

HOLLYWOOD Postmark! Letters, cards remailed 25c each. 8 scenic postcards \$1.00. Mailing address \$3.00 monthly. Stadler, Box 2335, Hollywood 28, California.

MEXICAN Postmark. Letters remailed. Mexico, Hollywood, Los Angeles, or San Diego. 25c. Box 2661, San Diego, Calif.

MANUFACTURERS Names any item \$2.00. H. M. G. Company, Mecca, Ind.

BALTIMORE—Letters remailed 25c each. Help wanted, business opportunity columns air mailed \$1.00. Q-Service, 4328 Glenmore, Baltimore 6, Maryland.

RENO, Nevada—Sacramento, San Francisco, California. Dependable re-mailing service. Letters, cards 25c each. M. Custer, P.O. Box 1404, Sacramento, California.

DETROIT, Cincinnati, Indianapolis, letters remailed 25c each. Detroit paper help wanted section 50c. Edwards, Box 1087, Allen Park, Michigan.

CARTOONIST Wants steady position with syndicate. Cecil Lowen, 952 St. Marks Ave., Brooklyn, N. Y.

HUMOROUS Caricatures. Send photograph and \$5.00. C. Lowen, 952 St. Marks Ave., Brooklyn 13, N. Y.

INFORMATION On any matter. Ferguson Research Specialist, 116-14 141st St., South Ozone Park 38, N. Y.

LETTERS, Remailed from Chicago 25c; other states 30c; Europe and South America \$1.00; Asia, Africa \$1.50. Foreign air mail 25c extra. Chicago mailing address \$5.00 per month. Salesman's mailing service. C. Mack's Mail Order, 5656 N. Hermitage Ave., Chicago, Ill.

NEW York City newspapers mailed any where. \$1.00 each. Bereson, 380-92d St., Brooklyn, N. Y.

TEXAS. Letters remailed 25c. Surprise friends. Huebner, 1112 Danube, Houston, Texas.

CARTOONING, COMMERCIAL ART, SHOWCARD WRITING, SIGN PAINTING

LEARN Cartooning, commercial art, showcard writing, etc., quickly. Literature free. National Artists, 801 North Marshall, C-3, Dallas 3, Texas.

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 95-C, Pleasant Hill, Ohio.

HANDPAINT Neckties for fun and profit. 25 sport and novelty patterns, plus "How to Paint." \$1.00. Walker Studio, Dept. M5N, 4343 Lindell, St. Louis, Mo.

CARTOON Charts make cartooning easy. 400 comic illustrations 25c coin. Randall, 312 First, Peoria, Illinois.

"SELL Simple Cartoons" market guide. Free. Jay Borosky, 300-2nd Ave., San Francisco, Calif.

WRITE For free art test. American, Box 8066, Dallas, Texas.

BE Smart. Get in art. Let me start you free. 25 years experience. Nick Nichols Arts, 39 W. Adams, Chicago 3, Ill.

LEARN Sign painting at home. Test lesson free. Ben Kerns, Box 812-P.M., Greenville, S. C.

CHALK Talks. Laugh producing program. \$1.00. Catalog 10c. Balda The Cartoonist, Oshkosh, Wisconsin.

ADVERTISING AGENCIES, LETTER WRITERS, FOR ADVERTISERS

MAILING Lists—New Orleans area. Thousand \$4.00, others \$3.00, \$1.00. Sinclair, Box 762, New Orleans 2, Louisiana.

FREE Radio advertising, commission basis, details 25c. Williams Agency, Box 17814D, Los Angeles 34.

WANT-Ads placed. Southern dailies. Lists free. National Advertising Agency, 414½ N. 21, Birmingham, Alabama.

FREE Copy, layout service. Mailorder ad, 1,700,000 nationwide circulation, \$27.30 inch. 24-word classified, 20 big Sunday newspapers, \$30.00. Advertising ratebook free. Chicago Advertising Agency (established 1900), Chicago 4.

NAMES: Compiled daily. 500, \$2.00; 1000, \$3.50. Bolaine Sales Co., 75 N. Cleveland, Rm. 12A, St. Paul 5.

ADVERTISE: 24 Words, 100 Canadian newspapers \$5.50. Lists free. Advertising Bureau, 10511-C Springfield, Chicago 43.

ADS Placed in out of town newspapers and magazines. Low rates. Catalogue free. Ideas that pay. Baker Advertising Agency, Successors Ankrum Agency, 189 W. Madison, Chicago 2.

ADVERTISERS! Reach nearly 18,000,000 readers. 25 Sunday national key newspapers. 18 words, \$59.00. "Terrific pullers." 20 popular newspapers, \$11.50. Free booklet. Special—One inch display 2,-821,198 circulation, \$51.10. Newmark's Advertising Agency, (Established 1893), 217-7th Ave., New York 11.

MAILING Lists: \$5.00-1000 up. Write Dixie Service, King, N. C.

RUBBER STAMPS AND OFFICE SUPPLIES

BETTER Quality! 3 lines, \$1.00; one, 40c. Fast service, printing, etc. Catalogue. Johnson Press, Box 6-A, New York City 26.

RUBBER Stamps—Send for catalog. Excello, Box 500, Shreveport, Louisiana.

3 LINE: Self-inking pocket stamp. \$1. Bauer-Lee, Sierra Madre 5, California.

3 LINES 50c; Pads 35c; signature \$2.35. Stamp-Right, Wauwatosa, Wis.

TYPEWRITERS, DUPLICATORS, OFFICE DEVICES

RECONDITIONED Typewriters, printing devices, office machines, equipment. DixieGraph, King, N. Car.

PRINTING OUTFITS AND SUPPLIES

MAKE Your own self-molding rubber printing cuts. Plexirubber, Argyle 1, Wis.

PRESSES, Type, cabinets, supplies. List for stamp. Lincoln Press Company, 220-G Hartwell, Fall River, Mass.

PRESSES, Supplies, paper. Catalog 10c. Custom, Box 211-P, Springfield, Missouri.

PRINT Your own cards, stationery, circulars, advertising. Save money. Simple rules. Print for others, nice profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, L-11, Meriden, Conn.

PRINTING Presses, type, supplies. Lists 3c. Turnbaugh Service, Loysville, Penna.

PRINTING, MULTIGRAPHING, MIMEOGRAPHING, GUMMED LABELS

MIMEOGRAPHING, Low prices. Price list free. Copy Rite Letter Shop, 76 Wesley, Atlantic Highlands, New Jersey.

VARI-Typed heading, typewritten copy. 100 8½ x 11 \$1.00. Eloise Johnston, Pocatello, Idaho.

TWO Color designed letterheads. Samples free. Osgood, 1320 Prospect, New York 59.

NEED Printing? Request samples, prices. Gooch, 202PM, Hernando, Miss.

MIMEOGRAPHING, Screen printing, posters (any copy), mailing. Lowest prices. Sinclair, Box 762, New Orleans 2, Louisiana.

8½x11 LETTERHEADS. 500, \$2.50; 1000, \$4.00. Samples. D'Yarmett Printing, Newark 2, Ohio.

200 BUSINESS Cards \$1.00. Lipke, 1127 Hoffman, Long Beach, California.

BUSINESS Cards 78c; name cards, 28c; envelopes, 69c; gummed stickers 23c. Wholesale printing. Samples—Lists 25c. List only 10c. Tickets Co., (304Z), 3456 S. State, Chicago 16.

1,000 8½x11 HAMMERMILL Letterheads \$5.00, statements \$3.00. Woodprint, Romeo 183, Mich.

5000 CARDS, \$12.50, 500 Hammermill letterheads \$5.50. All forms of business printing. Oren, Printer, Valliant, Okla.

FREE Samples, prices. Quality work. Prompt delivery, postpaid. Sutton Printing, Box 853-M, Waycross, Georgia.

SLASH Your printing costs. Catalog, samples free. Customprint, 4506 Bedford, Omaha, Nebraska.

200 LETTERS Mimeographed on printed letterheads 8 1/2 x 11 only \$2.00; 500, \$4.25; 1,000, \$6.10. Ross S. Weygandt, Box 313P, Wooster, Ohio.

OFFSET Printing, 200 letters on watermarked bond \$2.00. Prices, samples free. Planet Printing, 505 Tucker, Chattanooga 5, Tenn.

PRINTING—Offset, 8 1/2 x 11, \$6.95 thousand. Send stamp for offset copy instructions. Price list. Kale Brothers, 2250 Milwaukee, Chicago 47.

1000 BUSINESS Cards \$2.35. Other printing. Dornfeld, Iron Ridge 14, Wis.

BILLHEADS, Statements, letterheads, 5 1/2 x 8 1/2, 2000—\$8.95, 4000—\$15.25, postpaid. Free samples. Community Press, East Aurora, N. Y.

PRINTING—5000 5 1/2 x 8 1/2 Circulars \$18; 3 1/4 x 5 1/2 \$8.25; folders, books, everything. Garrison Press, Harrisonburg, Va.

QUALITY Printing. Stationery, circulars, booklets, publications. Free catalog. Adams, 30 West Washington, Chicago 2, Illinois.

100 8 1/2 x 11 HAMMERMILL Letterheads and 100 envelopes \$1.95. H. Hudson, Centredale, R. I.

5000 #6 3/4 ENVELOPES Printed \$3.10 per thousand. 1000 embossed business cards \$4.25. Free samples. Michel, Box 76, New York 10.

EMBOSSSED Business cards. Free samples. Vine Ad Press, 582A Courtland Avenue, New York 51, New York.

MIMEOGRAPHING—Letters, pricelists, formulas, instructions. Lowest prices. Lem's Letter Shop, 5710 Stanton, Detroit 8.

125 8 1/2 x 11 LETTERHEADS And 125 #6 3/4 envelopes \$2.00, postpaid. 250 of each \$3.50. Going Print Shop, Box 1544A, Muskogee, Oklahoma.

1000 BUSINESS Cards \$2.50 prepaid. Samples free. Reliable Print Shop, 907 East Jefferson, Louisville 6, Ky.

500 3 1/2 x 2 1/4 FOUR Line gummed stickers 50c. Red border \$1.00. Moritz Printery, Saginaw, Mich.

PATENT ATTORNEYS

INVENTORS—If you consider your invention to be something of importance, take steps to protect it with a United States Patent which gives you the right to exclude others from making, using and selling your invention as claimed. "Patent Protection for Inventors" outlines steps to take to secure patent protection. Mailed promptly without obligation. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 731-E Merlin Building, Washington 6, D. C.

INVENTORS—If you believe that you have an invention, you should find out how to protect it. The firm of McMorro, Berman & Davidson is qualified to take the necessary steps for you. Send for copy of our patent booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorro, Berman & Davidson, Registered Patent Attorneys, 134-P Victor Building, Washington 1, D. C.

"INVENTOR'S Guide" free. Frank P. Ledermann, Registered Patent Attorney, 154 Nassau Street, New York.

REGISTERED Patent attorney offers services. Sanders, 6430 Evans, Chicago 37, Ill.

PATENTS. "Proof of Invention" free. E. E. Vrooman, Registered Patent Attorney, 507 McKim Building, Washington 5, D. C.

INVENTORS—For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a patent. Write Patrick D. Beavers, Registered Patent Atty., 936 Columbian Bldg., Washington 1, D. C.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 38.

INVENTORS: Learn how to protect your invention. Special booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the U. S. Patent Office and prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 21B-D District National Building, Washington, D. C.

C. A. Snow & Co.—M-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a patent. John N. Randolph, Registered Patent Attorney, 203 Columbian Bldg., Washington 1, D. C.

CANADA—Ramsay Company Registered, 279 Bank Street, Ottawa, Canada.

FOR INVENTORS

INVENTORS—If you believe that you have an invention, you should find out how to protect it. The firm of McMorro, Berman & Davidson is qualified to take the necessary steps for you. Send for copy of our patent booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorro, Berman & Davidson, Registered Patent Attorneys, 134-M Victor Building, Washington 1, D. C.

INVENTORS—If you have a valuable invention, you are advised to authorize a preliminary search through appropriate classes of United States patents. This firm is registered to practice before the Patent Office and is available to make such search and report to you concerning the probable patentability of your invention. Instructive booklet with "Evidence of Invention" form sent upon request. Victor J. Evans & Co., 732-E Merlin Building, Washington 6, D. C.

PATENT Searches, \$5.00, including patent copies. Same reliable search as conducted for patent attorneys. Free protection forms, 48 hour services. Patent Service Institute, 945-A Pennsylvania Avenue, Washington 4, D. C.

SAVE \$200 On your patent! Free details for postal card, Oil Field Engineer, Box 8, Spring, Texas.

INVENTIONS. Sold, leased, complete services. M. Joyce Humphries, 1425 Landtitle, Philadelphia 10.

SELL Your ideas or unpatented invention yourself. Read how. \$2.00. Write for free details. James R. Garcia, "A" Street Station, Clearwater, Florida.

INVENTORS! For "Copyright, Design and Patent Guide" contact Mr. Metzler, 11 West 42nd, New York 18.

INVENTORS: Learn how to protect your invention. Special booklet "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be promptly forwarded to you upon request—without obligation. We are registered to practice before the U. S. Patent Office and prepared to serve you in the handling of your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 21A-D District National Building, Washington, D. C.

PATENT Searches \$5.00, including patent copies. Same reliable searches we conduct for patent attorneys. 48 hour airmail service. "Record of Invention" free. Capitol Patent Service, Box 664-P, Washington 4, D. C.

PATENT Searches \$5.00. Record of invention forms free. 48-hour service. Write Miss Ann Hastings, P. O. Box 176, Washington 4, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a patent on your invention. John N. Randolph, Registered Patent Attorney, 203 Columbian Bldg., Washington 1, D. C.

SEARCHES—Put your patent searches in the hands of a registered patent attorney or agent, as he qualifies to give a worthwhile patentability report. Record of invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 936 Columbian Bldg., Washington 1, D. C.

PATENT Searches \$5.00. 48-hour service. Protection forms free. Write Raymond L. Smith, Patent Searcher, 410 Bond Building, Washington 5, D. C.

INVENTORS—For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

CASH For your idea, 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 206M Clinton, Oak Park, Ill.

PATENT Searches \$5.00. Protection forms free. Patent drawings prepared. Write Patent Engineering Service, 1404 New York Avenue, Washington 5, D. C.

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 40A, 631-E St. N.W., Washington 4, D. C.

CASH In on your ideas! Learn which inventions are profitable: how to sell or finance and market your invention. Send only \$2.50 for the big 144-page book "Money From Ideas," a primer on inventions and patents by a real, successful inventor. Popular Mechanics Press, Dept. 104, 200 E. Ontario St., Chicago 11, Ill.

INVENTIONS WANTED

NEW Inventions wanted for listing for benefit of our manufacturing contacts and nation-wide distribution channels. Inventors and Manufacturers Exchange, 1000-P Broad Street, Newark 2, N. J.

INVENTIONS Wanted. Patented or patent pending. 21 years experience promoting inventions. National Service Bureau, 3120 Meramec, St. Louis 18, Mo.

INVENTORS—Good patented, patent pending inventions wanted by manufacturers. Booklet free. Market Contacts, 719-A2 Magnolia, Tupelo, Miss.

INVENTIONS Wanted by manufacturers. Patented-pending only. Free details. Inventors Exchange, Dept. B, Hartford 1, Conn.

INVENTIONS Promoted. Patented or unpatented. Established 1911. Write Adam Fisher Company, 61 Enright, St. Louis, Mo.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 40-D, 631-E St. N.W., Washington 4, D. C.

PATENTS FOR SALE

PATENTED Cube sugar dispenser. Sanitary, foolproof. For eating houses or homes. Contact Al. C. Hansson, Route 1, Box 21, Monroe, Wash.

INVENTORS: Test the commercial value of your patented or unpatented inventions, quickly and inexpensively. Write for free information. Institute of American Inventors, Dept. 40-B, 631-E St. N.W., Washington 4, D. C.

MANUFACTURING

MODELS—Small lot manufacturing. Metals, plastics, etc. Milburn, Burlington, Kentucky.

MODELS, MODEL SUPPLIES

SCARCE Model magazines, catalogs, books. Send needs. Sauder, 1300 Dawes, Muskegon, Mich.

BUILD Your dream house in miniature with our realistic model makers' materials. It's easy and exciting with our plywood panels of brick, siding, shingles and plastic doors, windows, etc. Accurately scaled, economical, time saving. For booklet, "How You Can Build Model Homes;" samples; and handsome 1952 book containing 65 plans of popular homes, illustrated in full color; send \$1.00 to Architectural Model Materials, Inc., Dept. M52, 4208 Armitage Avenue, Chicago 39, Ill.

SKYHOOKS Will drop gliders, etc., from your kite. Dollar postpaid. Burns, Box 84, Manhasset, N. Y.

BUILD Historic ships, vehicles. 50c to \$9.00 kits. Illustrated catalog 10c. Ideal Models, 19 West 18th Street, New York 11.

SHIP And yacht model fittings; blueprints. Send 25c for illustrated catalog No. 27—listing hundreds of items. A. J. Fisher, 1002-1 Etowah Ave., Royal Oak, Mich.

SHIP Models—Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. Illustrated catalog 25c. James Bliss & Co., Inc., Dept. SM, 220 State St., Boston, Mass.

LIONEL, American Flyer, illustrated catalog free. Ben's PM Department, 134 North Dearborn, Chicago 2.

SHIP Models and yacht supplies complete. Large 64 page catalogue 30c. Bill Wild's, 510 East 11 St., New York City 9.

STEAM Locomotives, 1 1/2", 1", 3/4", 1/2" 1/4" scales. Castings, rail, steam fittings! Thorough drawings with instructions. Catalog 50c. Little Engines, Wilmington, California.

HOME CRAFTSMEN

WOODCRAFT Patterns—20 unique, full size designs. Mermaid, comic, cannibal, other out of the ordinary subjects, 75c. Walker Studio, Dept. M5P, 4343 Lindell, St. Louis, Mo.

MOLD Making simplified for concrete flamingos and duck sets. Instructions and illustrations \$2.00. Stanley Both, Bayview Rd. 5, Hartsburg, N. Y.

90 ALL New, full size lawn ornament and novelty patterns, up to 20" high. Only \$1.00. Mastercraft 52M, 7041 Olcott, Chicago 31, Illinois.

LEATHERCRAFT Supplies. Tops in leather, tools, designs. Instructive illustrated catalogue 25c. Fastest service known. Govan Craft Supplies, 3908 Grove Street, Oakland 9, California.

SHELLCRAFT Catalogue and eighteen late designs 25c, refunded first order. Rice's Shellcraft, Dept. B, 1711 N. Mills St., Orlando, Florida.

LAWN Furniture. Make the unusual now, with standard materials. No special tools. Unique sample plans 35c. Aircraft, 24 Ayre Drive, Albany 3, N. Y.

FULL Size patterns. Toys, furniture, whatnots. Illustrated catalog 10c. P. M. Willard's, Canoga Park, Calif.

16 NEW Lawn chairs, 22 picnic tables, benches, trellises, etc. All 38 plans with necessary full size patterns, \$1.00. Mastercraft 53M, 7041 Olcott, Chicago 31, Ill.

CYPRESS Knee Lamp size \$1.00. Cy Products, Ella Street, Lafayette, La.

RUBBERIZE Anything. Puts beautiful heat-electric resistant coat on any surface. Make grips for screwdrivers, pliers, golf clubs, bats, rackets, coasters, molds. Waterproof. 1/4 pound \$1.00. Kassal, 401 West End Ave., New York City.

OUR Biggest leather and craft catalog yet! 1000's of items. Send 25c (refunded with first order). Russo Handicraft Supplies, Dept. 5-C, 245 S. Spring, Los Angeles, California.

PAINT "Porus" materials. "weathered masonry," etc. Copyrighted information, 75c. Box 111, Columbus, Ohio.

JIGSAW Owners attention! Start earning money at home cutting out wooden novelties and souvenirs. Write H. Cook, Dept. A, 4407 S. Normal Ave., Chicago 9, Illinois.

69 FULL Size jig saw patterns of beautiful shelves, ornaments, toys, novelties. Plus "How, Where to Sell." Only \$1.00. Mastercraft 54M, 7041 Olcott, Chicago 31, Illinois.

LEATHERCRAFTERS: Illustrated catalog of materials, tools, kits, 10c. Art Leather, 411 Joseph Ave., Rochester 5, N. Y.

THRIFTEE-Fix mender for hobbyists and craftsmen. Mends wood, metals, plastics; anything. 30c per tube. 4 tubes \$1.00. J. R. Gregory, 4858 Georgia-PM, Kansas City, Kansas.

30 LAWN Ornament patterns. Ready cut. Full size. Color indicated. \$1.00 postpaid. Lincoln Craft Studio, Columbia, Conn.

60 PATTERNS—Furniture, shelves, toys, garden cut-outs and 80 page hobby book. Send \$1.00. Crafters of Pine Dunes, 225 Poplar St., Oostburg, Wisconsin.

LEATHERCRAFT. Everything you need. Illustrated list 15c. Fairway Company, Rye, N. Y.

LEATHERCRAFT. Everything needed by beginners, advanced hobbyists and professional leatherworkers. Largest stock of supplies in U. S. Moderate-priced tooling leathers, top quality calfskins, tools, supplies, kits. Send 10c for big catalog. J. C. Larson Co., 820 S. Tripp, Dept. 2050, Chicago 24.

BUILD Ultra modern book cabinet with bar, radio. Plans \$1.00. E-Z Builders, P.O. Box 1146, Providence, R. I.

BEAUTIFUL Hardwood plywoods; 1/8" and 3/16". Hobbyists convenient sizes. Samples, prices 10c. Plydeal, Raynham Center, Mass.

COLONIAL Reproductions—Full size jig saw patterns, (32) Early American shelves, trays, stands, cupboards, etc. Useful. Saleable. Only \$1.00. Vossbury Patterns, M.R. 95, Binghamton, N. Y.

ABUNDANT Low-priced leathers. Make leather belts, billfolds, purses. Big catalog free. Tandy Leather, Box 397-C, Tulsa, Oklahoma.

LEATHERCRAFTERS: Beautiful tanned snake skins, kits, finished products. Tex Harris Snake Farm, Box 424, Warsaw, Indiana.

FREE Shellcraft catalog. Shell instruction book 35c. "Secors," Bradenton Beach, Florida.

6 DOZEN Assorted, sanded, wooden pegs, turnings, balls, etc., \$1.00. Crafts Center, Salisbury, Vermont.

WOODWORKING Patterns, full size. Large assortment \$1.00. Sample 25c. Duty free. Mosbro Patterns, 44-M, Victor, Mimico, Ontario.

MAKE Jig saw wall designs. 10 animals, 7 locomotives, 11 car train. \$1.00. Pauls Plans, 2233A N. 35, Milwaukee 8, Wis.

LEATHERCRAFT. Textile painting, beadcraft, shellcraft, many other crafts. Big free catalog shows everything you need. Kit Kraft, 7377 Melrose, Hollywood 46, Calif.

TROPICAL Woods: Send \$3.00 for samples, descriptions, prices. Apartado 372, Tegucigalpa, Honduras.

LEATHERCRAFT. Tremendous stock of leather, tools, supplies, and kits. In leather business over forty years. Send 10c for big catalog. Sax Bros., 1111 No. 3rd, Dept. PM, Milwaukee 3, Wisconsin.

WOOD Carvings make wood projects beautiful and valuable. Illustrations and prices free. Hasse Carvings, 35 S. Oxford St., Indianapolis 1, Ind.

MINIATURE Furniture kits. Solid cherry. Easily assembled. Large selection. Catalog 20c. Culver Miniatures, 194 Sixty First St., Dept. A, Niagara Falls, N. Y.

METAL Spinning. Everything in spinning lathes, tools and accessories. Send 20c in stamps for metal spinning instruction book and big catalog on woodworking tools. Boice-Crane Company, 943 Central Avenue, Toledo 8, Ohio.

LEATHERCRAFT Bargains! Lacing. Francis Byrd, 3406 Montrose Ave., Richmond, Va.

VIOLINMAKERS, Amateurs, professionals. Fine tone European wood, materials, supplies, instructions, patterns. Illustrated catalogue 10c, refunded. Premier Violin Supplies, Dept. VZ, 430 South Broadway, Los Angeles 13, California.

"TOPS" In everything for leathercraft. Low priced kits, leathers, tools, lacing. Catalog 10c. Crown Leathers, 22 Spruce Street, New York 38.

FREE Information. How to make money with jig saw. Write Jigsawers, 117-M Worth, New York 13.

WOODCRAFT Patterns—Large whatnots, lawn ornaments, toys, novelties, large assortment \$1.00. Joanes, Box 141-E, Omaha 7, Nebr.

WHOLESALE Shellcraft book 15c. Large shellcraft kit \$1.85 postpaid. Shell-Art Novelty, 5th and Moore, Philadelphia 48, Penna.

\$46 FROM Square foot plywood; jigsaw necessary. Write: Woodarts, Bridgewater, Mass.

KNOCKDOWN Cedar chests. Lumber and veneers. Free price list. Giles & Kendall Company, Huntsville, Ala.

HAVE Fun! Make money! "Working With Leather," 64-page booklet tells how. Send 25c for copy. Free gift if you mention this magazine. Valuable information included. No foreign orders. Wilder & Company, 1039 Crosby, Chicago 10.

LEATHERCRAFT Supplies catalog. Pleasure and profit. New style handbag patterns, belts. Leathercraft school G.I. approved. 25c for catalog (refund 1st order). Dept. PM, Apache Leather Co., 2004 E. Washington St., Phoenix, Arizona.

LEATHER. Tools, lacings, supplies. Free catalog. National Handicraft, 199 William St., New York 7.

FREE Giant Popular Mechanics 40 page Golden Anniversary Book Catalog! Over 400 books on workshop planning, home building, household repairs, projects, motoring, sports, photography, money making opportunities, machinery, inventions, crafts, hundreds more. Many not available in stores. Send postcard today to Popular Mechanics Press, Dept. 110, 200 E. Ontario, Chicago 11, Ill.

MAKE IT YOURSELF

IMISTONE Home, beautiful blocks precast by yourself inexpensive and easy to erect. Send \$1.98 for easy-to-follow illustrated instructions to Imistone Co., Gobles, Mich., Dept. M.

MAGAZINES (Back dated). List, 10c. Arnold Klein, 183 Scholes, Brooklyn, N.Y.

DAMP Basement? Build your own dehumidifier. Plans \$1.00. Great Lakes Engineering, Box 3833, Cleveland 10, Ohio.

NEW Admiral streamline refrigerator cabinets \$39.50. Metro, 44 North Albany, Chicago.

MECHANICS Handbook plans, tips, formulas 25c. JSSCO, 2623 Columbus, New Orleans, La.

BUILD Over 100 machines with Kimo Plans. Box 307-P, New York 19. Satisfaction guaranteed. Catalog 25c (refundable).

FREE Handbook. Build sawmills, block machines, freezers, tractors, scooters. Nichols Company, Purvis 2, Miss.

GRANDFATHER Clock easily built. Big savings. See ad on page 241.

"CONCRETE Block Homes." 32-page booklet, on how to build. \$1.00. H. C. Lightfoot, Civil Engineer, Richboro 1, Penna.

HOW To Build most maneuverable small riding tractor in use. Low cost. Easy to build. Turns around inside three foot circle. \$1.00 on how to build with manufacturer's patent plans. Turn-O-Bout, 1668 Willamette, Eugene, Oregon.

STREAMLINED. Built-in kitchen cabinets to fit any kitchen. Illustrated manual describes designing and construction. All for \$1.00. Thornbert Company, Newton, Iowa.

MAKE Your own "Stone-Veneer." Economical. Easily made, quickly applied. Looks like genuine stone. Transforms any home into one of excellent beauty. Formulas, illustrations, patterns. Aiburg, Box 17, Carrollton, Mich.

\$750 BUILDS Cozy 4 rooms and bath; concrete block, stuccoed. Instructions and blueprint \$1.00. Farrow, G83, Box 645, Columbus 16, Ohio.

SEND 25c Today for new large catalogue of supplies for 21 popular crafts. Dept. D-11, Dearborn Leather Company, 8625 Linwood Avenue, Detroit 6, Michigan.

BUILD Your own "tractor." Free information. Eltraco, D-1, Camptonville, California.

HOMES You can build for \$4500 to \$7046. Books that take you through every step. Popular Mechanics Famous Concrete Block House, \$2.00. Your Home and How to Build It Yourself, \$3.00. Also full-sized builder's plans for each home at nominal price. Popular Mechanics Press, Dept. 102, 200 E. Ontario St., Chicago 11, Ill.

WATCHES, OLD GOLD, JEWELRY

10 HIGH-Grade Swiss ladies' and gents' wristwatches needing minor repairs. \$18.00. Write for price list. B. Lowe, Holland Bldg., St. Louis 1, Mo.

RHINESTONES. Jewelry settings, cameos, sequins, beads. Send 10c for illustrated catalog. J & M Novelties, Dept. CE-3, Griffith, Ind.

WATCHMAKERS' Tools, materials, supplies, repairs, catalog. Gales, Box 1000, Chicago 90, Ill.

WATCHES Completely repaired, \$4.50. Guaranteed. Berkowitz, 1150 Castlehill Ave., New York 61.

EARN \$7.00 Chronograph wrist watch! Easy. Box 267, New York 5, N. Y.

FREE Catalog Swiss wrist watches. 17 jewel guaranteed calendar watch. Gives date, day, month, moon phases. Yellow gold. Formerly \$71.50, now \$36.96. Tax, postage paid. C.O.D.s accepted. 10 day money back guarantee. Dutz Enterprises, Box 284, Lincoln, Ill.

SWISS Watches from importer. For resale only. \$3.25 up. Free catalog. Transworld, 565 5th Ave., New York 17.

HIGHEST Prices paid for old gold, silver, platinum, diamonds, watches, gold teeth, spectacles. Cash immediately. Goods returned if offer unsatisfactory. United Smelting Works, (The Old Reliable), 39-B South State, Chicago 3.

WATCHMAKERS' Hobbyists' complete informative catalog 20c. Bengal Company, Culver City, Calif.

5000 JEWELRY Styles, you can easily make yourself—Pins, earrings, bracelets, rings, matched ensembles. Instructions and catalog 10c. Barrys, 101 Ardsley Court, Newark, N. J.

WATCHMAKERS' Journal contains instructive articles for watchmakers and beginners. \$1.00 year. Sample copy 20c. Dean Co., Box 3218, Daytona Beach, Fla.

HIGHEST Cash paid for old, broken jewelry, gold teeth, watches, silverware, diamonds, spectacles, platinum. Free information. Satisfaction guaranteed. Rose Smelting Company, 29-A East Madison, Chicago.

TOBACCO, SMOKERS' SUPPLIES

CIGARETTES—Roll 200 mild-satisfying for 75c. Particulars free. Pete Moberly, Box 850, Owensboro, Kentucky.

CIGARS, 25 Havanas \$2.00. S & E Company, Red Lion, Penna.

OF INTEREST TO WOMEN

HOME Sewers—Send 10c for folders and profitable working details. Baby Gay, Beaver Dam 6, Wisconsin.

FOR SALE—MISCELLANEOUS

THE World's most amazing catalog, 230 fantastic pages of sensational bargains at savings up to 85% in war surplus and factory close-outs. Values in general merchandise such as clothing, housewares, hand and power tools, foam rubber, outdoor and camping equipment, photo supplies, plastics, metals, hydraulic cylinders, valves, pumps and many hundreds more. Send only 50c to cover handling and mailing. Palley Supply Co., Rm. 14, 2263 E. Vernon Ave., Los Angeles 58, Calif.

USED Vending machines. Route operation. Vassar, 3500 14th, Washington 10, D.C.

CHROME Cabinet and bathroom hardware. Write Box 89, Troy, Ohio.

SAVE Money on army, navy and factory surplus. Write today for new 48-page illustrated catalog. Tennusa Sales Co., Dept. AN, 1451 Market, Chattanooga, Tenn.

WANTED—MISCELLANEOUS

WANTED—New products for mail sales. Major Products, 17342 Evergreen, Detroit, Mich.

NEED New Items! Have 100,000 men mail order buyers clamoring for merchandise. What have you? Louis Tager, 141-B, N. LaBrea Avenue, Los Angeles 36, California.

SCRAP Mercury (quicksilver) tantalum, bismuth, tungsten. Metallurgical Products Company. Established 1909. 35th & Moore Sts., Philadelphia 45, Penna.

PERSONAL

BORROW By mail. Loans \$50 to \$300 to employed men and women. Easy, quick. Completely confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Give occupation. State Finance Co., 323 Securities Bldg., Dept. L-14, Omaha 2, Nebr.

PERFUME! Wholesale only! World's finest French-type perfumes. Distributors wanted! Catalog, details, generous sample 25c. Elliott-Stuart Limited, 4616-P Hollywood Blvd., Hollywood 27, California.

PARIS Remail, 3 letters \$1.00. D. Sloan, 14 Rue D'Abbeville, Paris X, France.

COMPLETE Handwriting analysis, \$1.00. Lee, Box 112, Lemoyne, Penna.

"**HOW Can I find out?**" You can! Information discreetly developed. Any matter, person, problem, anywhere. Worldwide. Officially licensed, bonded service. Established 1923. Reasonable. Confidential. William Herman, 170 Broadway, New York.

LETTERS Remailed or replies forwarded 25c each. Monthly rates \$2.00. McLaughlin, 369 Welch, Columbus 7, Ohio.

NEED A gift? Sample, literature free. Box 48, Brooklyn 35, N. Y.

KEPAUVER Crime comm. report. Rack-tearing crime book. Send 50c to A. L. Snyder, 169 Norfolk St., New York 2, N. Y.

FEET Sweat? Throw off odor? Quick relief. Money-back guarantee. \$1.00. Red-O-Lent Co., 1359 No. Mackubin St., St. Paul 3, Minn.

ASTOUND Friends. Letters remailed 25c. Anne, 3750 Franklin, Riverside, Calif.

HERE'S How and where to borrow \$50.00 to \$300.00 by mail. Confidential. Free particulars. Postal Finance Company, Dept. 45, Sioux City, Iowa.

MEXICAN Law practice reliably conducted. Box 1736, El Paso, Texas.

MISCELLANEOUS

25 PIECE Assortment of high speed drills, up to 1/4", slightly imperfects. P.P. prepaid, \$2.50. Jossé Hdwe. Co., 318 E. Henn., Minneapolis, Minn.

CESSPOOL Trouble? Start leaching and weeping process by instilling Sursolvent, the miracle cesspool and septic tank reconditioner. Saves pumping. Reduces odors. Opens clogged pipes. Reclaims old systems to a condition approaching newness. Simple to use. Mix with water and pour down sink. Write for descriptive literature. Chemical Cesspool Cleaning Co., Boston 34, Mass.

AMAZINGLY Different razor—Makes shaving fun! "Live" blade gives wonderfully smooth, effortless shave. Nothing like it! Low introductory price now. Kenmore Distributors, 3619-M Kenmore, Chicago 13.

NOW You can have an exact replica of the air force insignia for only 50c. With each order you receive free our latest 1952 military surplus catalogue containing over 1000 items. Monarch, 270-M West 43rd St., New York 36.

JUNIOR College students. Mathematics, slide rules, Bargains. Free catalog. Bartro, 11B East Peoria, Pasadena, Calif.

STOCK Signs on masonite, weatherproof, low cost. List. Pate Ackerman, Inman, S. C.

SHOP Aprons 2 patch pockets, 1 mike pocket. 44 inches long. Denim or hickory stripe \$1.25 each postpaid. Bailey, 284 Dover, Boston, Mass.

BIG Mails, mail order magazine opportunities 25c. Harvey Teeple, Decatur, Indiana.

HAIRCUT As you like it. Booklet explains. 25c. Mastrolia, 5 1/2-BM Jane, New York City 14.

300 BIG Mails guaranteed. Samples, plans, offers, propositions, eight months listing. \$1.00 (refundable). Wright Publications, 2370-M Hubbard, Memphis 8, Tenn.

INDISPENSABLE Pocket kits. Tool, Fishing, Outdoor, Knife. Free catalog. Trader Lewis, 105 East Delaguerra, Santa Barbara, Calif.

STOP Thief! Children protected; lock window partly open! 18 secret window-door locks; unlocking key, \$2.00! Simple installation! Burglary alarms! Complete! Home-yard \$8.00, automobile \$3.00. Refundable! Autocraft Products, 429 Jefferson, Gary, Indiana.

LEARN Sharpening and adjusting hand and power lawn mowers yourself. \$1.00. Wirt's, 2419 Gnahn, Burlington, Iowa.

HOME Lubrication kit: Seven lubricants for all home motors, bearings, appliances. Rust preventor free. \$2.00. Cape Cod Chemical Co., Box 472, New Bedford, Mass.

SELECTIVE Metal and mineral detector. Revolutionary design. Distinguishes metals from black magnetic sands. Readily detects metals under salt water. Free literature. Gardiner Electronics Company, Department 12, 2018 N. Dayton, Phoenix, Arizona.

QUALITY Ties, 3 exchanged for 3, \$1.00. Elliott, Rockton, Ill.

INFORMATION. Any subject. The Roxbys, 5440 Fulton Ave., Van Nuys, Calif.

INCREDIBLE! Unprecedented! Become a mental superman overnight! Floor everybody! No studying! "Memoprop" does all your thinking! It's uncanny! Revolutionary! Write: Bijou, Box 1727-MR, Hollywood 28, California.

"**SUN & Fun Magazine**"—Paying pastimes; 15c. M. Pennebaker, Kerrville, Tex.

WE Purchase Indianhead pennies. Complete album catalogue 20c. Rupert Fairview, 273 Broadway, New York 7.

RECEIVE Mails, magazines, samples. Your name in numerous mailing lists 20c. Sully Greenwood, 273 Broadway, New York 7.

FREE Catalog! War surplus clothing. Amazing bargains. N. Y. Clothing Co., New York 29A.

WINDOWS Stuck? Open tightest windows in minutes. New, amazing device, 75c. Hansen Products, Box 365, Rockville Centre, New York.

SPECIALIZED Magazines will help you to success. Get latest copies of those covering your field through our easy-to-get-acquainted service. Hundreds of business, craft, professional, fashion, feed, fertilizer, fish, florist, food, foreign trade, forestry, fraternal, fruit, fur farming and others covering all interests. Send for list today. It's free. Commercial Engraving Publishing Company, 34E North Ritter, Indianapolis 19, Indiana.

LATEST, Most popular gift novelty. Write, Kaywak Sales, Dover 2, N. J.

NOISE. New ear sound filter. Hear conversation but stop loud noises. No wires, batteries, lasts indefinitely. Protect your health, increase your efficiency, comfort. Free details. Anza Company, 3560A 20th Street, San Francisco 10, California.

"**MARKMASTER**"—Mark, write, print on metal, glass, wood, paper. Instant dry ink, blue, black, violet, red, yellow, green, \$1.50 delivered. Unlimited possibilities for salesmen. Appleton Company, Anoka, Minnesota.

CESSPOOL Trouble? Use Peps-It. Saves pumping costs, deodorizes, reduces masses, rejuvenates fermentation action. Safe. Sanitary. Free descriptive literature. Costs only \$2.50. Chemical Cesspool Cleaning Co., Boston 34, Mass.

THE Lord's coming! Get free proofs. Evangelism, 263, Duluth, Minnesota.

HAIRCARE Booklet for healthy hair. Send \$1 to Woods, 6823 Ridge Boulevard, Brooklyn 20, N. Y.

CAN You make \$40 a week, typing at home, in your spare time? Write Hood's, Hannapolis 12, N. C. (Enclose stamped, addressed envelope.)

BRAZILIAN Orchids. Ask catalog. Orquideario Catarinense, Exporters, Corupa, Santa Catarina, Brazil.

ATTENTION Home weavers—Maysville carpet warp and rug filler—all colors available; immediate delivery. Kay Craft Co., Olyphant, Penna.

VERMONT Maple syrup, pints \$1.35 postpaid. Sugar and cream, 100% pure. Butternuts, hickorynuts. List, Marshall Maples, Poultney 5, Vt.

RECEIVE Giant mails, magazines, catalogs! Three months 25c, year 50c. Waddell's Directory, 341B East 76th, New York 21.

DRESSES 24c; Shoes 39c; men's suits \$4.95; trousers \$1.20. Better used clothing. Free cat. Transworld, 164-AD Christopher, Brooklyn 12, N. Y.

GOLD, Silver, metal detectors. Geiger counters for uranium, Mineralights. Sensational new fully guaranteed models. None finer. Information free. Detectron Co., 5631 Cahuenga Blvd., North Hollywood, California.

LEATHER Jackets repaired. New knit, zippers or relined. Work fully guaranteed. Jackets made to order. Free circular. Taubers, 689 Mission, San Francisco 5, Calif.

MEDICAL Laboratory Technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-J, Austin, Texas.

OUTDOOR Toilets, cesspools, septic tanks cleaned, deodorized with amazing new product. Just mix dry powder with water; pour into toilet. Safe, no poisons. Save digging, pumping costs. Postcard brings free details. Burson Laboratories, Dept. C-36, Chicago 22, Illinois.

TREASURE Finders for gold, silver and minerals. Money back guarantee, best available. Also Geiger counters for uranium prospectors, free information. Write Goldak Company, 1541 West Glenoaks, Glendale 1, Calif.

PANNING Gold lesson and catalogue. Beginners supplies, books, "maps where to go" free. Old Prospector, Box 729D1, Lodi, Calif.

TREASURE—M-Scope Geiger counters, mineral locators. Why buy something inferior when you can buy the best at a lower price? Backed by years of experience. Fully guaranteed by factory. Detects minerals, metals, gold, silver, coins. Payment plan available. Proven superior performance. Free 16 page illustrated booklet. Fisher Research Lab., Inc., Palo Alto, California.

Compare Clip!

mowa - **M** - matic

POWER MOWER BUYER'S GUIDE

	OTHER MOWER	MOW-A- MATIC
FULLY AUTOMATIC OPERATION... Throttle controls all action like your new car. No clutch controls necessary.		✓
SAFOMATIC NEUTRALIZER... Exclusive safety feature!		✓
STOR-A-WAY HANDLE. Free floating; shock absorbing. Stands upright for storage.		✓
4-CYCLE NATIONALLY ADVERTISED ENGINE... Service available in your locality.		✓
HIGH SPEED REEL — 640 R.P.M. 5 self-sharpening blades. Cuts any kind of grass smoothly.		✓
WELDED ARMOR PLATE STEEL FRAME... Drop out reel for easy servicing.		✓
HIGH SPEED PRECISION BALL BEARINGS... SEALED. Longer life!		✓
HEAVY 1/8" STEEL SAFTI-HOOD. Grass guard and bumper. No flying grass and stones.		✓
1 3/4" TREAD TRACTA TIRES... Semi-pneumatic; puncture-proof; slip-proof.		✓
HI-LO FEATURE... Cutting height adjustable from 1/4" to 2".		✓
STRAIGHT-LINE STARTING & OPERATION... No troublesome pawls; no backlash.		✓

Nothing can be finer

Mow-a-Matic "18"
Chain drive, 1.1 HP.....
\$112.50

Mow-a-Matic "21"
Chain drive, 1.5 HP.....
\$127.50

Mow-a-Matic 21" "Aristo-
crat." All chain drive,
1.6 HP.\$142.50

Prices F.O.B.
Factory plus Tax

**AUTOMATIC
DRIVE
LIKE YOUR
NEW CAR!**



It's Mow-a-Matic

FREE!
Illustrated
manual of
features
to look
for in a
power
mower.

Write to
Dept. 5-M

MOWAMATIC CORPORATION
137 S. FIFTH AVENUE, MT. VERNON, N. Y.
Pioneers of Fine Power Mowers

New Lightning Seller! 47 Million Prospects! Up to \$4.97 PROFIT on Every Order!

An invention like the new "Magic Defroster" comes along only once or twice in a man's entire lifetime. GRAB IT QUICK! Everybody in the United States who owns an electric refrigerator is a prospect for the "MAGIC DEFROSTER" because it ends FOREVER the need of manual defrosting. Just plug in any outlet and the refrigerator defrosts AUTOMATICALLY overnight. Saves electric current... saves time, work, and money. And the "MAGIC DEFROSTER" is NATIONALLY ADVERTISED — outsells all similar devices.

FREE! "MAGIC" SALES PLAN
NOTHING ELSE LIKE IT. Boosts cash earnings to new all-time high. Sent FREE with complete money-making facts about the "MAGIC DEFROSTER" — fastest seller to hit Direct Selling Field in years. Salesmen, Crew Managers, Distributors are flabbergasted by Sales. Rush your name on a postcard today. Everything is FREE.

MAXILUME COMPANY, 125 West Hubbard Street, Dept. D-8-E, Chicago 10, Illinois

**AMAZING
"Magic
Defroster"
RETAILS FOR
Only \$9.95**



TELEVISION Needs You For Top Pay Jobs!

Learn How You Can Qualify With Our 2 FREE BOOKS
WRITE: Radio Television Training Association
(State age) 1629 Broadway, New York 19, N.Y. Dept. R-25

PEEL PAINT TO BARE WOOD

With One Easy Stroke!

\$4.95 complete



Soften and peel paint off flat or contoured surfaces quickly and completely in one motion... without harming the wood beneath! 1000° heat softens paint; blade peels it off! Eliminates difficult and messy scrapings, dangerous chemicals and torches. Operates on ordinary household current. Complete with new "Kurve-Kleeners", shaped to conform to grooves, curves, fancy moldings. Ceramic heating element and rugged construction assure extra-long service. Price includes: "Kurve-Kleeners"; 8 ft. neoprene cord; automatic safety stand; complete instructions. Tool worth its price on first job! Ideal for furniture, sills, boats, all woodwork. Order from your dealer, or write direct today for fast delivery. You must be satisfied or your money back.

LECTRO DIVISION, DEPT. M

2189 WEST 26th STREET . . . CLEVELAND 13 . OHIO
MAY 1952

"How to Become a Mail Order Millionaire"

Read the inside facts about hundreds of "little fellows" who are running Mail Order businesses from their homes—many making \$20,000 and more every year! Learn how small investments (\$16.80 in one case!) have mushroomed into profits of thousands. This incredible

reprint from *Mechanix Illustrated* will be sent absolutely free, along with details showing how you can quickly master the secrets of getting orders and money in your daily mail, in a business that's all yours. Rush name today. A postcard will do.

The L. W. SURVEY 7070 North Clark Street,
Dept. 15, Chicago 26, Ill.



**SENT
FREE!**

RUSH NAME ON
POSTCARD TODAY

I'LL PAY YOU TO "GIVE AWAY" NYLONS AT 49¢!



REPLACEMENT OR REFUND OF MONEY
 Guaranteed by
Good Housekeeping
 IF NOT AS ADVERTISED THEREON

Did you ever hear of first quality, full fashioned nylon stockings at 49¢ a pair? Would you make money writing orders? Would any woman refuse to order? Would you have the sensation of the century? Sounds impossible, of course, but that's all they cost if they run or snag within guarantee period up to **THREE WHOLE MONTHS!**

This isn't selling. It's giving something away. Every day, women buy over two million pairs of nylon stockings. Imagine how eagerly they will order when you show them these fantastic savings on nationally advertised Kendex nylons.

There's nothing for you to buy or deliver. Just write orders. We'll deliver and collect. You get advance cash on every order and, in addition, can easily qualify for my huge cash bonus which increases your earnings by 40%!

FREE SAMPLE STOCKING!

I'm so positive you can make money that I'm willing to give you a sample stocking, color card and all sales materials absolutely free! I'll even pay the postage. What's more, you need promise nothing. The whole outfit is yours and if you don't make enough money, just throw it away!

I don't care if you are 18 or 80 — whether you can spare one hour or fifty hours a week. Man or woman — young or old — spare time or full time — experienced or not, this can be the opportunity you have been hoping for.

If you write me quick, I'll also include complete money-making outfit of a wonderful line of men's hosiery actually guaranteed **ONE FULL YEAR** or replaced free without question!

MAIL THIS COUPON NOW!

Date.....

Michael H. Kent, President
 Kendex Corporation
 Babylon 446, N. Y.

Send me, absolutely free and postage prepaid, your complete money-making outfits including free sample stocking. It is understood I am under no obligation and if I am not satisfied with the money I make, I will throw away the outfits.

Name.....
 Address.....
 City..... Zone..... State.....

BIG OPPORTUNITIES OPEN IN THE METAL TRADES



- * Drafting
- * Tool & Die Designing
- * Tool & Die Making
- * Machinist Trade

Only 60 school days - 360 Hours - of practical Shop Training or Mechanical Structural or Aircraft Drafting



Allied will train you easily and quickly for these important Trades and place you on a Good Paying Job.

Inquire about our **PAY AFTER GRADUATION PLAN**

Write for **Free Books** a postcard will do!

INDICATE PREFERENCE - RESIDENT or HOME STUDY

ALLIED SCHOOL of MECH. TRADES
 1338 S. Michigan Ave. Chicago, Ill.



SUCCESS-WINNING VOICE!

MEN... Do you want a hearty, friendly voice? A stronger **HE-MAN** voice that radiates more vigor, character and self-confidence?

STRENGTHEN your voice this tested, scientific way. Yes— you may now be able to improve the **POWER** of your speaking and singing voice... in the privacy of your own room! Self-training lessons, mostly silent. No music required. Write **TODAY** for Eugene Feuchtinger's great booklet "How to Develop a Successful Voice." It's absolutely **FREE!** You must state your age. Booklet mailed postpaid in plain wrapper. No salesman will call. Send your name and age **RIGHT NOW!** Perfect Voice Institute, 210 S. Clinton St., Studio EY-2, Chicago 6, Ill.

ENGINEERING DEGREE IN 27 MONTHS

INDIANA TECHNICAL COLLEGE

B. S. DEGREE, Aeronautical, Chemical, Civil, Electrical, Mechanical and Radio Engineering (inc. TV and Electronics). Drafting, 1-yr. G.I. Gov't approved. Low rate, Earn board. Large industrial center. Students from 48 states, 21 countries. Demand for graduates. Enter June, September, December, March. Write for catalog. 1852 E. Washington Boulevard, Fort Wayne 2, Indiana.

STUDY AT HOME

WITH AN EDUCATIONAL INSTITUTION

Courses in **ARTS AND SCIENCES**: Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Geology; Pol. Science; Theology; Law; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture. Courses in **ENGINEERING**: Electrical, Civil, Mechanical, Drafting, Architectural, Automotive, Steam, Diesel, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Refrigeration, Air Conditioning, Chemical. Send for free catalog.

McKinley-Roosevelt Incorporated, 4610-K32, Sheridan Rd., Chicago 40, Illinois

MAKE \$5 PER HOUR WITHOUT A PRINTING PRESS

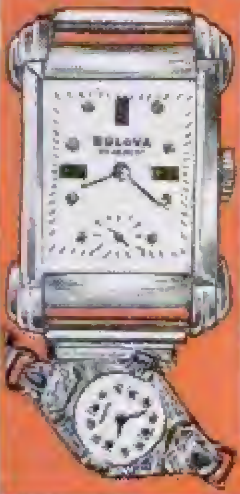
PRINTING REVOLUTIONARY **NEW SCREEN METHOD**
 PRINT colorful signs, posters, banners, fabrics, wall paper, show cards—**ANYTHING!** Print on any surface. NO printing press or special equipment is needed with this amazing "approved" new printing secret. **300% profit** on nearly every job. Easy to learn - **NO EXPERIENCE** or art ability necessary. Exceptional opportunity. Complete illustrated detailed plan and colorful sample **FREE**—Write.
SCREEN-PRINT COMPANY, Dept. 25
 1010 So. Los Angeles St., Los Angeles 15, Calif.



FAMOUS 15 & 17 JEWEL BULOVA WRIST WATCH \$16.95 PLUS TAX

UNLIMITED WRITTEN GUARANTEE

SAVE \$44 ON THIS 17 JEWEL WRIST WATCH \$14.95 PLUS TAX



WERE UP TO **\$59.50**
Save \$42.55

- Also Choice of
- BENRUS
 - GRUEN
 - WALTHAM
 - ELGIN

You get these unredeemed UNLIMITED GUARANTEED famous Bulova and other movements in latest style Yellow Gold Cases at this sensationally low price because we bought out SURPLUS STOCKS of leading New York and Md. jewelers. Order now while they last. Specify make preferred and whether men's or ladies! Only \$16.95, plus \$1.70 tax. Order right now!

WEAR AT OUR RISK!
Money Back guarantee in 10 days if not delighted!

SEND ONLY \$1 DOWN PAYMENT with order. Pay balance to postman on arrival plus postage. Or we pay postage if you enclose full payment plus tax.

FREE 10 DAY TRIAL

FREE EXPANSION BAND WITH EACH ORDER

FORMERLY SOLD FOR \$59.00

INCABLOC SHOCK PROTECTED WATER & DUST PROOF
Worn by ARMY, NAVY & MARINES

Luminous dial, sweep second hand. Super Accurate. Imported Swiss precision movement and case. You get these brand new UNLIMITED GUARANTEED watches now for a small fraction of the original price. You save \$44, because we bought out surplus stocks. Order men's style \$14.95 plus \$1.50 tax or ladies' and nurses' style, \$16.95, plus \$1.70 tax. Order now at this low price.



NURSES' MODEL \$16.95 Plus tax

FREE! Watch and Jewelry Catalog at Almost Wholesale Prices!

MARYLAND DISTRIBUTORS, Dept. 376 501 E. BALTIMORE ST. BALTIMORE-2, MARYLAND



LEOPARD 295 SATIN-LIKE "RICH-TONE" DESIGN Auto Seat Covers

TERRIFIC VALUE! New, deluxe RICH-TONE material looks like LEOPARD FUR, gives beauty and distinction to your car. Adds new life to old, worn interiors. Protects new car upholstery against wear, dust, grime, stains, grease, bad weather. Tough, durable, resists cracking! Handsome tailored appearance. For ALL cars, ALL years, ALL makes and models. NO pins! No tacks! No sewing! Ingenious SNAP-TITE feature. Just SNAP on or off in a JIFFY! Best of all: they're only 2.95 for front or rear seat.

SPECIAL! Pair for front and rear, only 4.95. Send no money. Pay price plus postage on delivery or send check or money order for free delivery and SAVE! Mention car make, model & year; also if front seat is full front or SPLIT coupe front. Try 10 days at our risk! Guaranteed to satisfy or money back! RUSH!

CONSUMERS MART, Dept. 6E-150
131 West 33rd St., New York 1, N. Y.



LEARN MEAT CUTTING

through actual practice. Profitable Meat Cutting and Self Service Meats taught easily, quickly. LEARN BY DOING at Toledo in just eight short weeks under actual market conditions. For beginners or men with experience. All subjects taught thoroughly and completely. Diploma, Job help. Get store of own. People must eat. School in operation over 25 years. Approved for GI training. Send today for FREE illustrated catalog. No obligation. NATIONAL SCHOOL OF MEAT CUTTING, Dept. 50-E, Toledo 4, Ohio



Our 483rd Advertisement REAL DIESEL ENGINE

\$2.95

- for planes, boats, midget cars
- 7500 RPM; 1 7/8 HP; ht. 3 1/2"; wt. 5 oz.
- precision machined for smooth operation

You just can't beat this price for a precision diesel engine! Streamlined, compact, easy to install. Thousands of satisfied users all over the world. Fast delivery if you ORDER TODAY! Send \$2.95 plus 25c postage.

GOHAM HOBBY CORP. Dept. P, 107 E. 126th St. New York 35, N. Y.

High School at Home

Many Finish in 2 Years

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 55-year-old school. Send for FREE descriptive booklet.

AMERICAN SCHOOL, Dept. H545
Drexel at 58th St., Chicago 37, Ill.

Without obligation, please send FREE descriptive booklet.

Name _____
Address _____

Make \$20 to \$30 a Day with this new **ONE MAN**

MAIL ORDER BUSINESS

DO PLASTIC LAMINATING AT HOME!



Would you like to get orders and cash from your mailman—then in space of hours make and ship the things people ordered from you? If you have spare time and a little spare room in kitchen, garage, or basement, get the facts about the newest and most fascinating of all home operated businesses. For the first time a simplified machine brings the fabulous profit of Plastic Sealing and Plastic Laminating within the reach of the small operator. Any one can learn to operate the machine with a few minutes practice—then

with our **Magic Mail Plan** can get mail orders pouring in daily with cash in every envelope. No canvassing—no selling. We even supply the circulars you mail to bring back cash and orders. Don't waste a minute. Rush your name. We'll send you, FREE and postpaid, pictures, prices, details, all the facts you need to start. Mail coupon or send name on postcard. No charge.

WARNER ELECTRIC CO., 1512 Jarvis Av. DEPT. L-10-E - CHICAGO 26, ILLINOIS

Make Thousands of Beautiful Art Creations

- COSTUME JEWELRY • CIGARETTE BOXES TRAYS • CANDLESTICKS • COASTERS LAMP BASES • BOOK ENDS...ALL IN SPARKLING COLORED PLASTIC



THIS MAN . . .
is taking out of the machine a Plastic Sealing Job—ordered by mail—only 11c in material cost brings back \$8.88 in cash by mail. Capacity of machine: \$25.00 profit per hour of operation.

WARNER ELECTRIC CO., 1512 Jarvis Av. Dept. L-10-E, Chicago 26, Ill.

At no cost to me, please rush complete details postage prepaid. I am under no obligation.

Name _____
Address _____
City _____ Zone _____ State _____



WORK IN COOL SAN DIEGO

Illustrated
book sent
FREE

San Diego offers you California living at its best — and Convair gives you the top working conditions. Employee Retirement Plan. Group Insurance. Two weeks vacation. Eight holidays annually. Free Housing Office and much more — plus that wonderful San Diego climate. These classifications now open for you:

- | | |
|-----------------------------|-------------------------------|
| 1. TOOL DESIGNERS | 8. FIELD & SERVICE MECHANICS |
| 2. TOOL PLANNERS | 9. AIRCRAFT MECHANICS |
| 3. PATTERN MAKERS | 10. AIRCRAFT ELECTRICIANS |
| 4. TOOL & DIE MAKERS | 11. IBM TAB MACHINE OPERATORS |
| 5. JIG AND FIXTURE BUILDERS | 12. INSPECTORS |
| 6. MACHINISTS | |
| 7. LOFTSMEN | |

CONVAIR

Send this coupon for FREE book and details:

Employment Office 700
Consolidated Vultee Aircraft Corporation
3302 Pacific Hiway
San Diego, California

NAME _____
OCCUPATION _____
ADDRESS _____
CITY _____ STATE _____

ENGINEERING DEGREE IN 27 MONTHS

Big Demand for Graduates

Aeronautical, Chemical, Civil, Electrical, Mechanical and Radio Engineering (inc. TV and Electronics)

Hundreds of young men are earning B. S. ENGINEERING DEGREES annually in this recognized institution — year around operation. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center.

Low tuition. Competent instruction. Thorough, intense, practical program. Modern, well-equipped laboratories including new physics lab and modern wind tunnel. Individualized instruction emphasized.

Gov't approved for G.I.'s. Engineering preparatory courses. Students from 48 states and 21 foreign countries. Enter June, September, December or March. Send coupon for free catalog and full information. Enroll now.

SEND COUPON TODAY

INDIANA TECHNICAL COLLEGE

552 E. Washington Boulevard
Fort Wayne 2, Indiana

Please send me free information on B.S. Engineering Degree in 27 months as checked.

- Aeronautical, Chemical, Civil, Electrical,
 Mechanical, Radio-Television

Name _____
Address _____

WANT TO Write Stories

FREE BOOK
tells how you
learn at home

Articles
Mysteries?



Would you be willing to spend a few hours a week learning to write so you may earn \$300-\$1200 a year part-time? Or many thousands full-time? FREE book, "Art of Writing Salable Stories" tells how to get started writing short stories, radio-TV scripts, articles, business items. Many students earn while learning (A.B. Aretz sold first 2 stories for \$255). Endorsed by famous authors, scores of successful graduates; approved for veterans. Send today for FREE book (no salesman will call).

PALMER INSTITUTE OF AUTHORSHIP, Founded 1917
1680 N. Sycamore Hollywood 28, Calif. Desk T-52

TASOPE PHOTO-ENGRAVING PLANTS



Establish your own profitable PHOTO-ENGRAVING business. Make cuts for newspapers, printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for FREE catalog.

Material Cost
Of This Cut 3/4c
Selling Price
\$1.00 And Up

TASOPE DEPT. PM5, AURORA, MO.

LOCKSMITHING & Key Making



PRACTICAL UP-TO-DATE COURSE—ONLY \$4.95

Easy-to-learn modern information for self-instruction. How to work on locks, de-code, make master-keys, repair, install, service, etc. For every handyman, home owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 plain illustrated lessons.

FULL PRICE ONLY \$4.95. SEND NO MONEY. Just pay postman plus C.O.D. postage. Or send \$4.95 with order. We'll ship postpaid. Satisfaction guaranteed or refund.

NELSON-HALL CO., 210 S. Clinton St., Dept. EY-2, Chicago 6, Ill.

Become an Industrial Designer...

Learn to design Automobiles, Products, Furniture, Stores and Offices, Packages, Displays and Exhibits. Your future begins now, studying with experienced, professional designers. B.P.A. Degree granted. Request Catalog I.

THE ART CENTER SCHOOL

5353 WEST THIRD STREET • LOS ANGELES

DON'T RISK INJURY... SAVE TIME NEW SAFETY LADDER LEVELLER



Home owners, painters, carpenters—sturdy safety ladder levelers are easy, simple to adjust. Insures safety on sloped surfaces... saves effort, time.

SATISFACTION GUARANTEED OR MONEY BACK!

Send check or money order. \$4.95
Shipped post paid.

ORDER YOURS TODAY!

SAFETY LADDER LEVELLER CO.
P. O. Box 22, Sta. A, Atlanta, Ga.



DO OWN MODERNIZING ^{save 50%}



Do your own home repairing, modernizing. Don't be robbed by sky-high labor costs. Giant new book shows how to save hundreds of dollars. Make space-saving cabinets, install picture windows, add new porch, convert attic into modern rooms, put on new roof, siding, insulate and save on fuel. How to do concrete work, build own garage, even complete new home. Reduces jobs to simple, easy steps. Over 100 illustrations. SEND NO MONEY. Simply clip this ad and mail with name, address (U.S. Only). If not pleased return in 5 days, pay nothing. If you keep book send only \$5 plus 35c for shipping.

NOTE: Save 35c by sending remittance with order. Same return privilege!
GOODHEART-WILLCOX CO., Dept. 178, 1321 S. Michigan Ave., Chicago 5



X.L. RUBBER MOLDS

will realize you great profits quickly!

WRITE FOR NEW FREE CATALOG

YOU can EASILY learn to cast thousands of perfect plaques, book ends, figurines, ash trays, etc. IT'S EASY, FUN, PROFITABLE! X.L. Rubber, Pts. \$2.50; Qts. \$4.00 (postage extra). Models and enough for 3 molds \$1.50 prepaid.

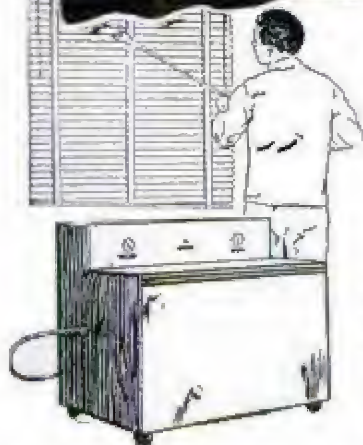


SEND FOR FREE FACTS

PLASTIC ARTS STUDIO Address Dept. 2
3403 S. Madison St.

Muncie, Ind.

BUILD A \$15,000 A YEAR FUTURE!



IN THE EXCITING NEW BUSINESS OF LAUNDERING VENETIAN BLINDS

There is big money to be made cleaning Venetian Blinds and a permanent, fast growing, Lifetime Business, besides.

An amazing new kind of business of your own in a field that is growing like mad. Millions of Venetian Blinds need laundering at regular intervals.

With our new patented machine, you can start small—using your basement, garage or utility room to begin with. You can expand as your business increases by leaps and bounds. Income up to \$200.00 daily already being made by others. Small investment for equipment starts your own lifetime business—and monthly payment plan permits you to pay for it as you grow.

FREE Get all the facts about this sensational new kind of machine that launders blinds so fast that your charges are unbelievably low. People would rather send blinds to you than do the work themselves. Yet, you make 700% profit on every blind you clean. Get names of successful owners near you. Get details of the full amazing plan without obligation. Be first in your territory to start a business that has brought \$15,000 PROFITS the first year to others. Wire today or send name on postcard.

VENETIAN BLIND LAUNDRY EQUIPMENT CO., INC.
442 N. SENECA ST. DEPT. 105 WICHITA 12, KANSAS

Use Your Spare Time

Learn ENGRAVING As a Career or a Hobby

WRITE TO

Build a business for yourself; Engrave Silver—Jewelry—Trophies right in your own home. Learn this fascinating craft by the NEW "SILENT TEACHER" HOME STUDY METHOD. Inquire today — or at our resident school.

KANSAS CITY SCHOOL OF WATCHMAKING
1218 Admiral Blvd. Kansas City 6, Missouri

NEW "PAINT PEN"

PAINT STRIPING TOOL
Works like a Fountain Pen
Stripes with Paint instead of Ink!

This amazing new "PAINT PEN" is a Paint Striping Tool that makes it easy to do expert striping on furniture, bikes, model planes, autos, signs, toys, linoleum, wall boards, etc. As you paint, painted walls look like tile. Paint straight, curved, circular or evenly spaced parallel lines the same way a professional painter does. Simply fill Tubular Glass Paint Points in with any color paint and wheel tip feeds paint evenly. Tips interchangeable — jaws split apart for easy cleaning. Tool complete with tip for 1/8 inch stripe only \$1.00 postpaid. Other complete tools with 1/8", 1/32", 3/64", 1/16", 5/64", 3/32", 1/8" inch tips, \$1.50 ea. Extra tips, 75c each. Complete KIT with 7 tips, \$6.00. C.O.D.'s postage collect. Here's the handiest tool in your whole painter's kit. Get yours today.



Paint
STRAIGHT,
CURVED OR
PARALLEL LINES

Home Craftsmen

Just the tool you've been waiting for! New Paint Striping Tool gives "professional" results every time, yet simple and easy to use as a fountain pen. Adjustable guide keeps lines straight as an arrow. Just as easy to make curves or free hand designs. Adds new beauty and finished look to everything you paint. Send \$1 now!

WENDELL MFG. CO., Dept 3-E,
4234 LINCOLN AVENUE, CHICAGO 18, ILL.

DEALERS
PAINT STRIPING TOOL
packed in display cartons
of 1 doz. Fast, profitable
seller. Write for illus-
trated circular, discounts

Only
\$1.00

YOUR PROMISE TO PAY IS GOOD ENOUGH!

1/3 DOWN \$100 a week
or
\$500 a month

Nationally Famous MONARCH WATCHES

only \$1200 down

As Trenton's finest credit jewelers, we've found it pays to trust folks. No lengthy credit investigations. Watches shipped in 24 hours. Money back within 10 days if not delighted.

MONARCH "Executive", yellow gold color, 17 jewels, "Commander", 17 jewels, waterproof, shockproof, anti-magnetic, dustproof, sweep-second hand, radium dial, expansion bracelet stainless steel. Both guaranteed \$50.00 values . . . only **\$36.00**



SHERWOOD JEWELERS,
45 E. State Street, Trenton, N.J.

Please send me the following watch:
"Commander" "Executive" at \$36.00.

I am enclosing Money Order Check for \$_____

and agree to pay \$_____ Per Month
Per Week till full amount is paid.

Name _____

Address _____

City _____ State _____

Employed at _____

FREE
crystals,
repairs and
adjustments
for ONE YEAR
on either
watch!

GROW Living MIDGET TREES!

EARN \$1000
PER HOUR!

- AT HOME
- IN SPARE TIME
- NO EXPERIENCE NEEDED



It's new! Amazing! At last, the secret of growing miniature (MING) trees can be yours. FULL GROWN, dwarf trees — only a few inches high. Beautiful miniature fir, orange, oak, Chinese elm, peach, pine, cypress—any kind! ALL BLOOM and even BEAR FRUIT. All perfect healthy specimens—but miniature in size! Make costly home decorations and expensive centerpieces. (SOLD FOR OVER \$1,500 EACH) Big demand. Costs only pennies — takes only minutes per week. IT'S EASY! Fun! A new fascinating hobby — a new fabulous \$\$\$\$ business. Send for free secret plan details and real seed.

HELP US FILL HUGE DEMAND!

These trees are being demanded by STORES
CLUBS • HOTELS • FLORISTS • HOUSEWIVES • INTERIOR
DECORATORS • COLLECTORS • HOBBYISTS — A Big Money
Opportunity FOR YOU.

FREE! GENUINE SEED AND PLAN!



NATIONAL NURSERY SUPPLY CO., Dept. M5

8463 S. Van Ness,
Inglewood 4, California

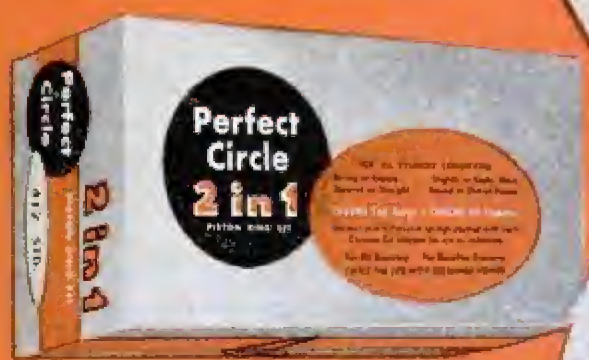
Rush me FREE plan and seed IMMEDIATELY!

Name _____

Address _____ Zone _____

City _____ State _____

New oil economy... lasting power



SOLID CHROME PROTECTS THESE WEARING SURFACES

Two interchangeable expander springs with each oil ring—NORMAL PRESSURE spring for rebored and slightly worn cylinders, HIPRESSURE spring for badly worn engines and known oil pumpers.

for thousands of **EXTRA** miles!

Perfect Circle's 2 in 1 chrome piston ring set

Your car and your money . . . both will go farther with a set of 2-in-1 Chrome Piston Rings. For the 2-in-1 Chrome Set more than doubles the life of cylinders, pistons and rings!

Positive oil control is assured because *only* the 2-in-1 Set provides two interchangeable expander springs with each oil ring. For the first time, mechanics can select the spring pressure that's *right* for your engine. And with 2-in-1 you'll enjoy smooth, instantly responsive power, right from the start with no tedious break-in period.

If your car has lost its pep . . . if it's wasting gas and oil . . . give it a whole new life of sustained power and oil economy with Perfect Circle's 2-in-1 Chrome Set! Ask your Doctor of Motors, your reliable mechanic, to install it in your engine. He'll respect your judgment!



Perfect Circle
PISTON RINGS
The Standard of Comparison



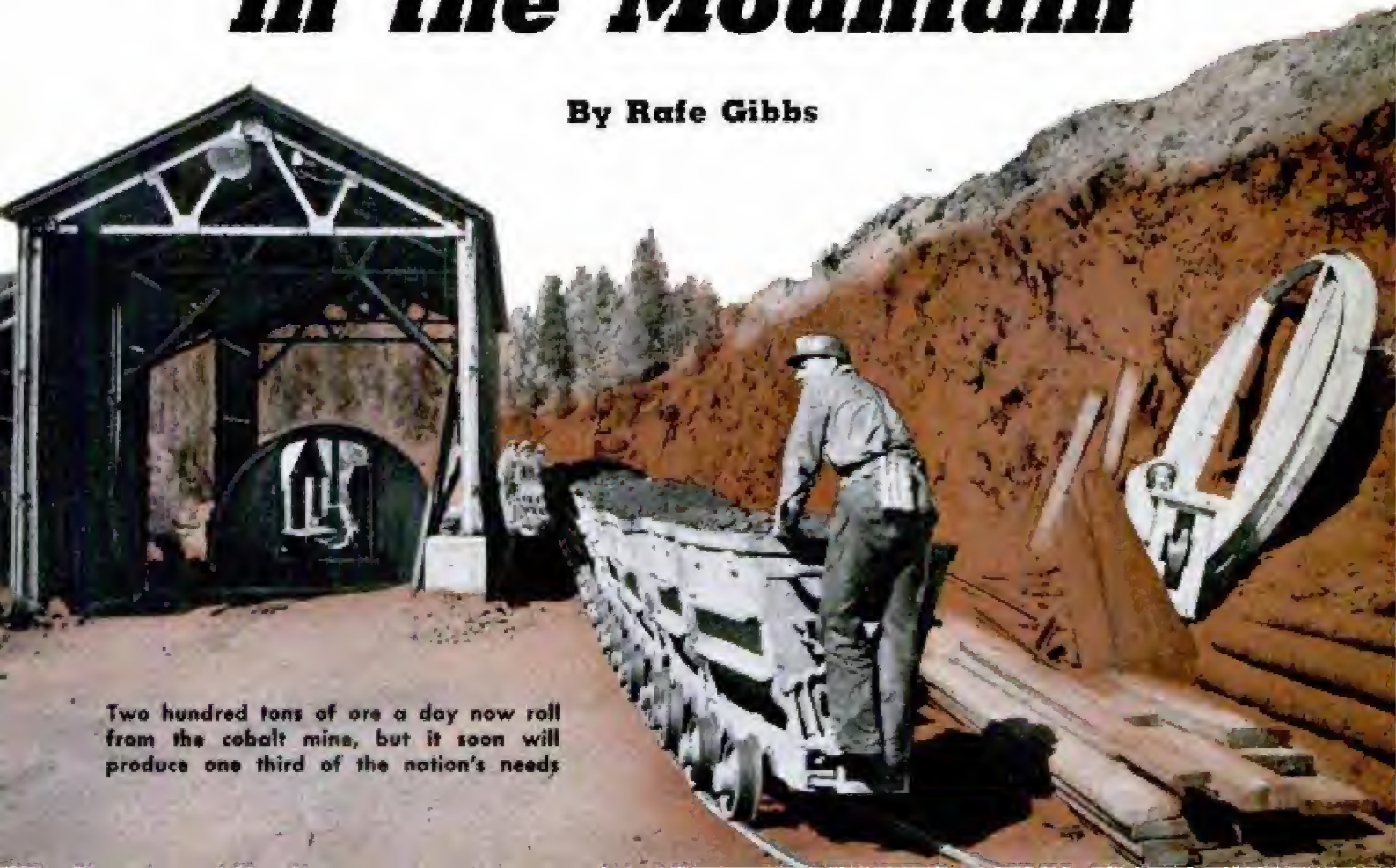
This is the hole in an Idaho mountain which leads to mine producing cobalt—scarce and vital metal

ON THE ROUGH fringes of Idaho's primitive area is a mountainside hole not very big in diameter. When one of the many deer ranging the slopes tried to investigate the hole, the animal got its antlers stuck. That hole is one of the most important in the nation today. It leads to rich deposits of cobalt—a fabulous metal that is vital to jet-airplane engines and guided missiles, a metal that has H-bomb possibilities.

The hole is the entrance to the Blackbird Mine on Blackbird Creek in Blackbird Canyon. The mine, a new development of the Calera Mining Company, a Howe Sound subsidiary, is America's hope that it won't be caught short on cobalt. Once called *kobold*—the German word for a mischievous spirit—because the ores containing it gave forth mysterious fumes, the metal has

THE RICHEST HOLE in the Mountain

By Rafe Gibbs



Two hundred tons of ore a day now roll from the cobalt mine, but it soon will produce one third of the nation's needs



Beside an old cabin of a gold prospector, a new pipe line is laid for the Idaho mine now producing cobalt

become a highly desirable spirit to have hovering over the nation's shoulder. Not only is it important to defense, but it is important to dozens of peacetime industries, including television and radio. It is important to the man who needs treatment for cancer.

The United States has long depended on the Belgian Congo for most of its cobalt (75 percent), but now cars heaped with cobalt-bearing ore are rolling out of that mountainside hole in Idaho. Two hundred tons a day—to be stepped up to 1000 tons upon

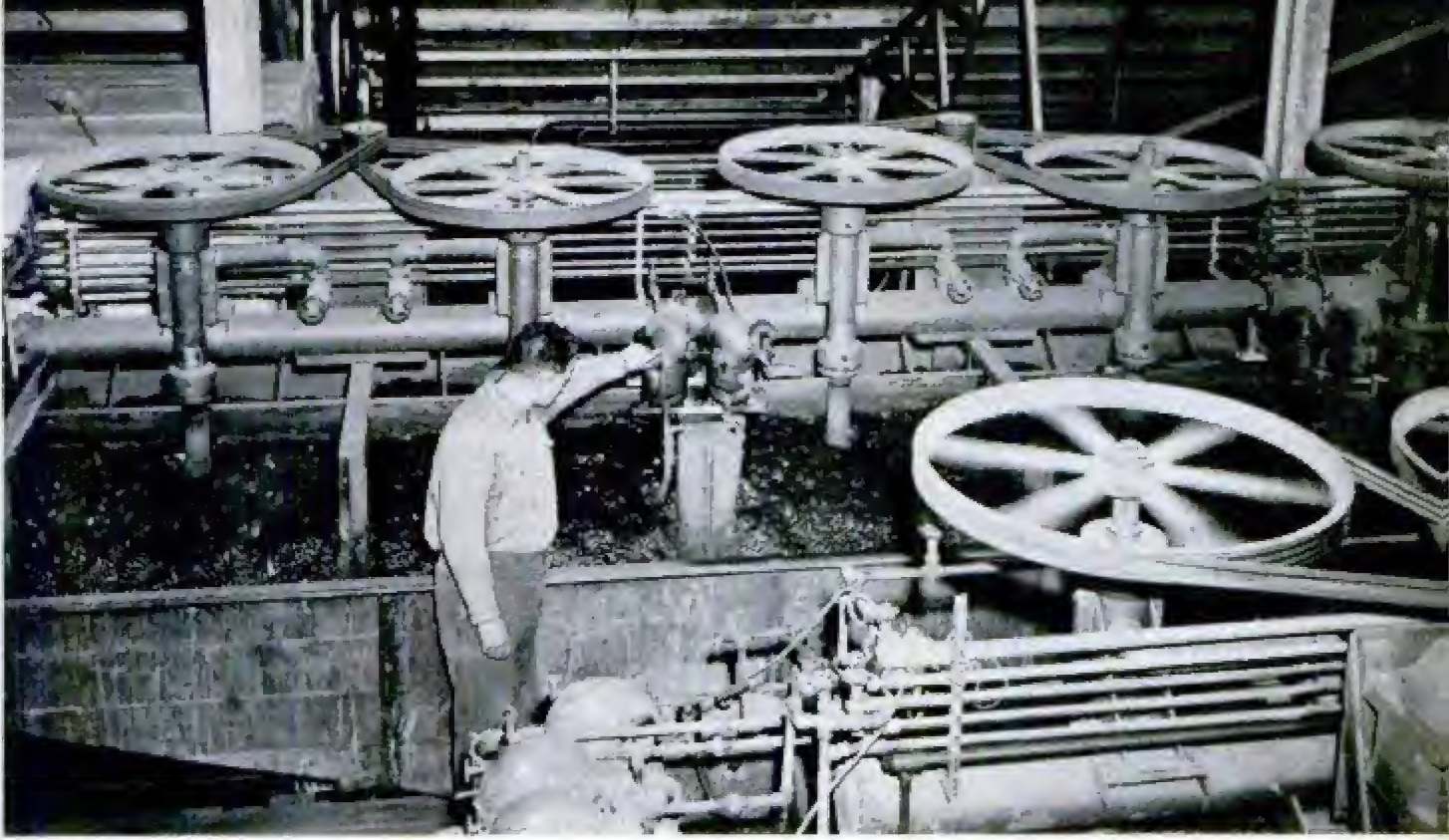
completion of a new refinery. By 1953, the annual Blackbird production of cobalt is expected to be at least three million pounds—36 percent of our 1950 consumption.

Near the mine, on an old ranch pasture beside Panther Creek, has sprung up a new town called Cobalt. Population about 450, and growing fast. Many cowboys from the area have traded 10-gallon felt headgear for one-gallon tin jobs, and spurs for pneumatic drills. They're helping ride herd on the mischievous spirit far from the sun.

Prospectors staked the original Blackbird

New roads to the cobalt mine had to be blasted through the mountains; one road took a carload of dynamite





Ore from Idaho mine gets a giant bubble bath in flotation process to extract the highly valuable cobalt

claims in the 90s. They gave the canyon its name when they flushed great flocks of ravens whose descendants still flit through the canyon brush. The early prospectors were after gold and copper. Plans were made for a smelter, and hundreds of cords of wood were cut and stacked on the mountainsides to feed furnace maws.

Most of the corded wood is still there, for the smelter never materialized. Isolation of the district and prohibitive operating costs killed the plans a-borning. Calera's construction workers, who bucked 25-below-zero weather in recent winters, warmed their hands over fires from the wood cut more than a half century ago. It was cheap fuel. Yellowed records found at the site showed that the early woodcutters had been paid 10 cents a cord to fell the trees and cut the wood into lengths that fit the furnace firebox.

There were other attempts to work the Blackbird — one company in the 30s was docked on the ore because the cobalt content was too heavy — but in more recent years the brush in Blackbird Canyon grew high and thick. The



Heavy equipment like the ore crusher above had to be trucked high into the mountains over rugged roads to the new town of Cobalt. Below, two samples of attractive modern homes built for the new employees of the Idaho mining community. The population is about 450





Men unload ore cars by hand because demand for cobalt was too great to wait for automatic dumping outfit

ravens continued to chatter undisturbed.

Cobalt has long been considered a valuable metal. The ancient Egyptians used its oxides in making pottery. The vases adorning Cleopatra's barge as it floated down the Nile had cobalt in their substance. So, too, had the famous Chinese vases of the Ming dynasty—that's what gave them their peculiar blue coloring. In the 17th century, when invisible ink was fundamental to royal intrigue, cobalt salts were highly prized.

These uses, however, were insignificant compared with those of today. Cobalt is tough stuff and is now used, for instance, as a binder for tungsten and carbide. The material made from this combination is so hard it serves as a diamond substitute. Cobalt gives jet engines the ability to withstand the terrific heat of terrific speed. Because of its "red hardness," it is also vital to high-speed cutting tools.

In July 1942 the demand for cobalt was as pressing as that for nylon stockings. The State Bureau of Mines and Geology at the University of Idaho sent Prof. Alfred L. Anderson down to have a look at the abandoned Blackbird Mine. Shortly thereafter, the professor rushed this message to the U. S. Bureau of Mines in Washington, D. C.:

"If the government wants cobalt, this is the place to come and get it."

The government did want cobalt, and the bureau immediately began intensive exploratory work. Howe Sound became interested, and in 1945—after two years of additional exploratory work on its own—started the staggering job of turning the old Blackbird into one of the world's greatest producers of cobalt.

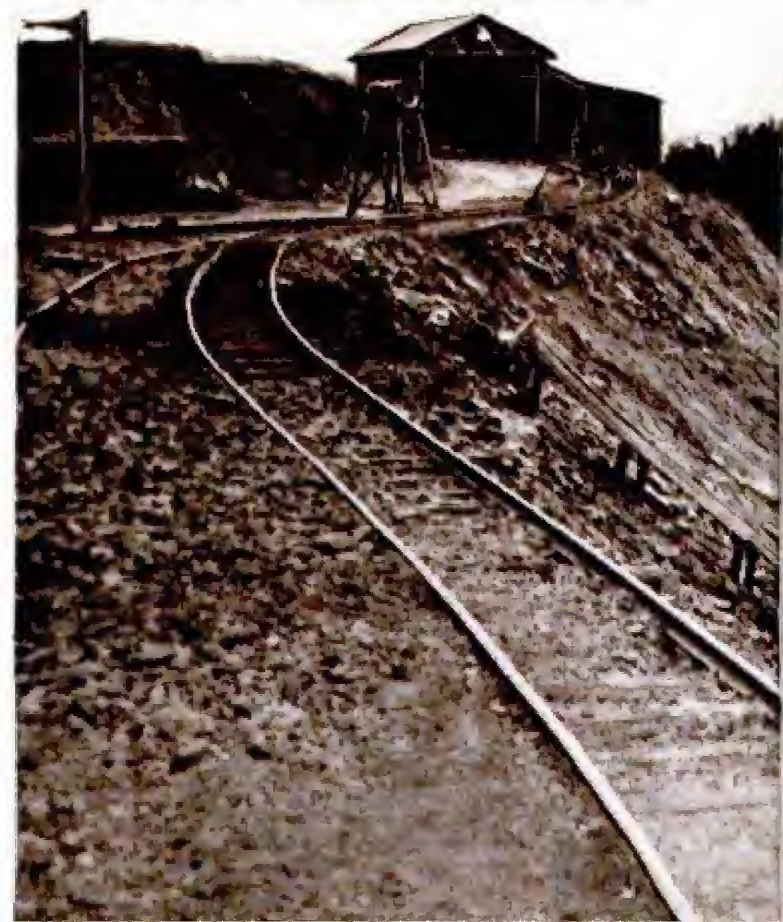
"We had problems," Edwin B. Douglas,

manager of the mine, told us when we went to the Blackbird recently. Douglas, we soon learned, is a conservative man. But he is also a hardy, square-jawed, pipe-puffing Scotsman who has a way of getting the job done.

The Blackbird is 107 miles from the nearest railhead—at Mackay.

"It was easy to have a carload of dynamite spotted at Mackay," said Douglas, "but getting the dynamite here by truck was something else again. Sometimes the roads wouldn't permit the trucks to roll, and the dynamite car would just sit while the people of Mackay got jittery."

There are two "main" roads leading to



the new town of Cobalt. An oiled highway is now being built from the south, but the road from the north, running 40 miles out of Salmon, is still rugged all the way. We took the north road.

Later, we checked in the W.P.A. guide for Idaho and read, "only the adventurous take this road." We wound around a narrow, mountain-clinging road that was breath-taking in more ways than one. Tumbling streams, sage, willows, poplars, huge boulders—all pressed back against the road that man had carved years ago. It reminded us of the stagecoach roads in Western movie thrillers.

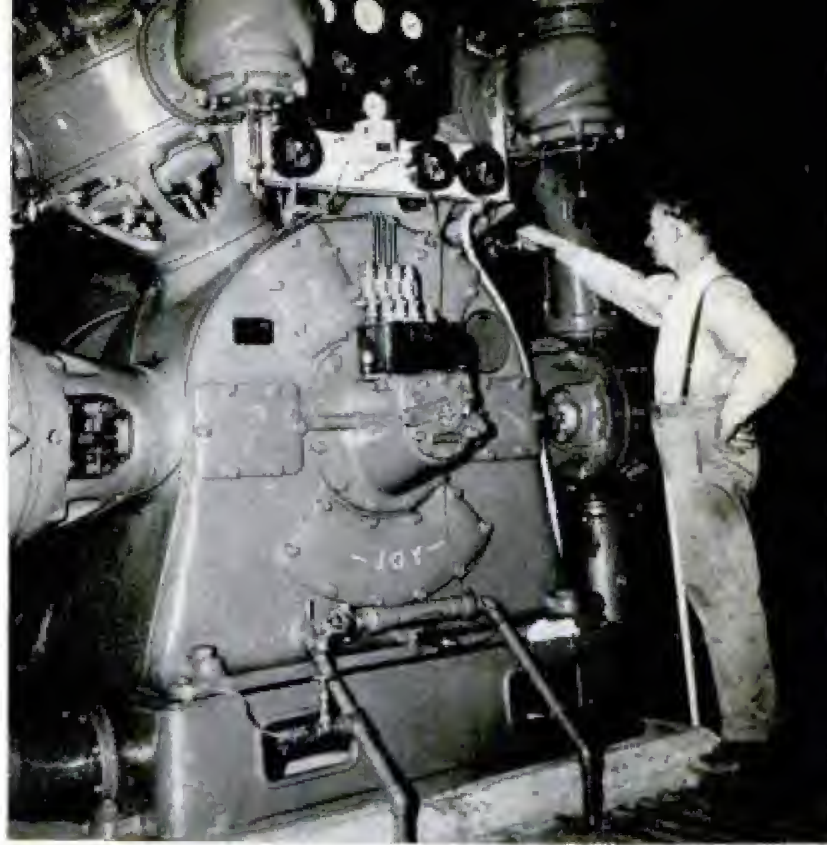
We mentioned this to Jim Caples, purchasing agent and personnel manager at the mine, who is a native of the area. Caples grinned:

"A four-horse stagecoach did travel the road as recently as 1929. I used to get jolted in it as a kid. The road was considered too rugged for motor transportation."

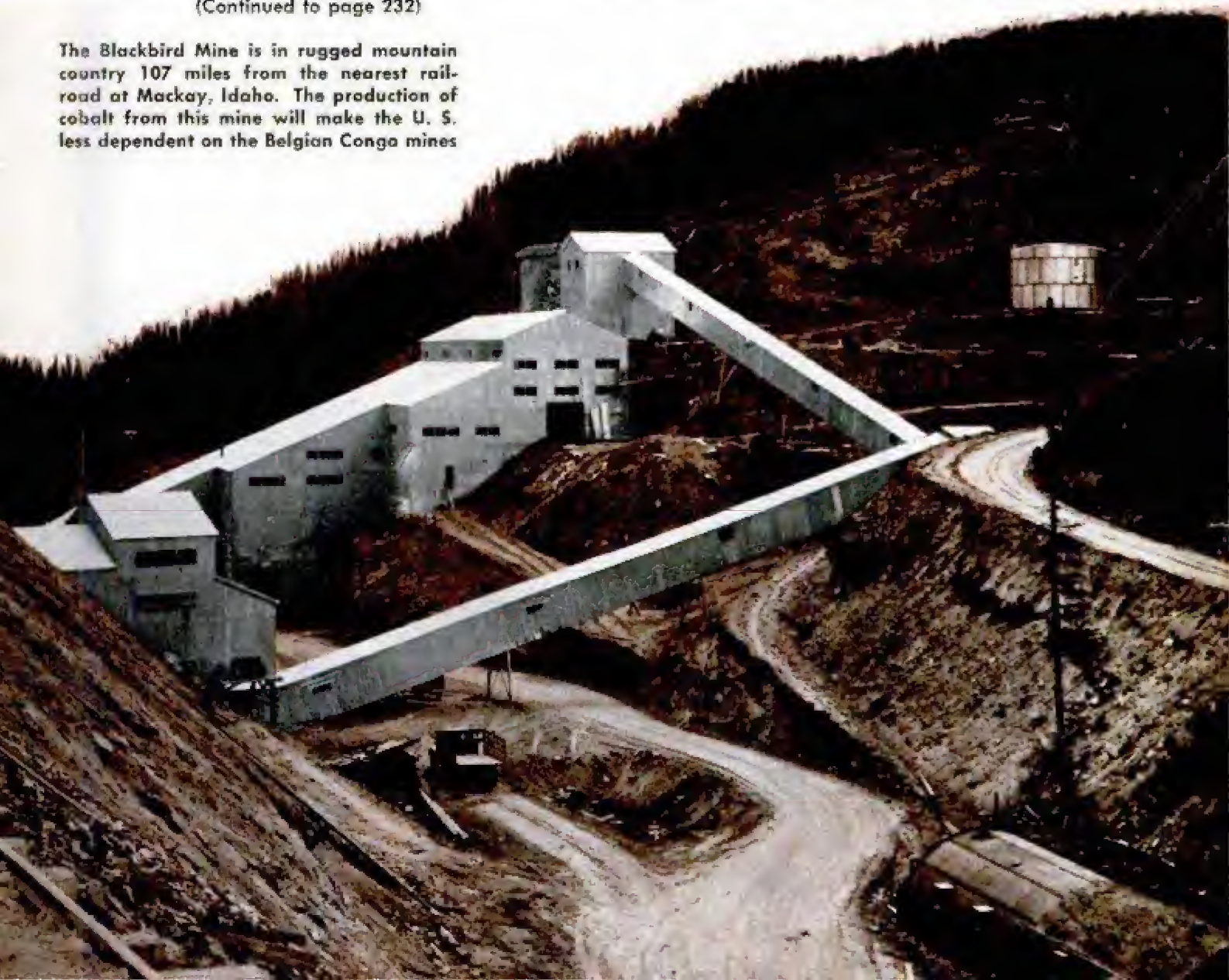
Getting dynamite to the mine was simple compared with hauling heavy steel equipment. Big tractors had to be hitched to trucks with 10 speeds. Tractors and trucks churned and groaned . . . but delivered the hard goods.

(Continued to page 232)

The Blackbird Mine is in rugged mountain country 107 miles from the nearest railroad at Mackay, Idaho. The production of cobalt from this mine will make the U. S. less dependent on the Belgian Congo mines



Pneumatic tools used far underground in the cobalt mine require lots of compressed air and the machine above supplies it. Mine tunnel extends 6400 feet





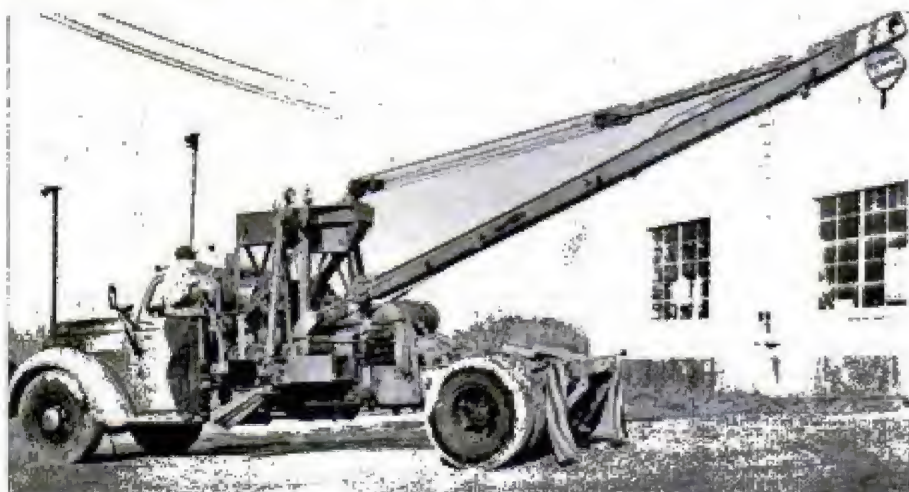
Electric Lifting Arm Clamps to Side of Plane

Clamped to the side of the fuselage in one minute, an electric lifting arm can quickly hoist either two litter patients or 500

pounds of cargo up to an airplane. It completes the lifting arc in less than 15 seconds. Weighing only 140 pounds, the lift, which was developed by the Douglas Aircraft Company, can be used and stowed in any transport airplane.

Derrick-Wrecker Transfers Cargo

To solve a business problem, garageman Herb Nimtz of Three Oaks, Mich., built a strange vehicle combining a wrecker with a derrick. Only a few miles from his garage is a Michigan truckweighing station, where trucks which are found to be overweight sometimes need their cargoes transferred before being allowed to continue. Nimtz also is called upon occasionally to pull wrecked trucks from ditches along the highway. The garageman started with an extended truck chassis and added a boom unit. The boom



normally measures 18 feet, but can be extended to 26 feet. Power for the winch, boom and cables comes from a 148-horsepower motor. Now Nimtz can pull trucks back onto the road and shift loads.



Circle-Cutter for Ceramic Tile Simplifies Tiling Around Fixtures

Perfect circles are cut in ceramic tile by a portable machine as easy to use as a can opener. The machine makes it possible to fit tile closely around pipes and other plumbing fixtures. Any size circle from 1¼ to 2 inches can be cut in less than one minute with the device. Clamps hold the tile in place while a handle is turned to cut the hole. The cutter measures only 5 by 7 by 13 inches.



British Superjets To Power Warplanes

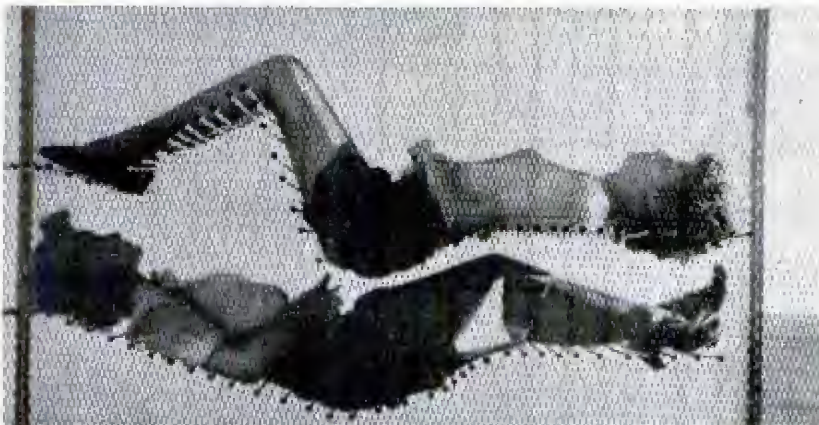
Two of Britain's newest, fastest warplanes will fly with Rolls-Royce Avon turbojet engines, rated among the most powerful in the world. Two will be in each De Havilland 110, a fighter heavily equipped with radar for bad weather and night interceptions. The 110 has sharply sweptback wings and a twin-boom tail. The Vickers Valiant, first four-jet bomber developed for the Royal Air Force, has four Avons completely concealed in its wings. Noteworthy features of the Valiant are large wing flaps, which can



be extended sharply to slow the plane, and unusually spacious bomb-bay doors. Performance details for the aircraft are secret.

Furniture Calculator Suspends Person in Mid-Air to Determine Contours

With a simple rig that suspends a person in mid-air, furniture designers can tailor-make a chair to fit the exact body contours of the subject. Rudolph Jegrt, an art instructor in Milwaukee, Wis., invented the contour delineator, which consists of two panels of steel mesh and some steel rods. The mesh panels are mounted two feet apart. A basic chair design is envisioned, and the rods pushed through the mesh to form the contour. The subject then climbs into the "chair" and the rods are shifted to match the subject's body lines.





Real chronometer is tiny, but this giant model better illustrates its role in positioning machine gun

nicians in learning dental anatomy. And it's only one of a vast assortment of ingenious giant and pint-sized models now playing a vital role in educating our armed forces.

The models usually do everything that the thing they represent can do. Cutaway spark plugs, three feet high, sputter and flash; monster carburetors demonstrate the working of each part; mockup rifles that look like cannon are cut away to show every intricate lever in operation. Complex instruments and computers, no bigger than your fist, are reproduced in size to accommodate an army of 60-foot giants.

LOOKING LIKE THE prehistoric jawbones of some man-eating menace in the dinosaur hall of a museum, a huge assembly of teeth, gums and other oral equipment wheels in and out of classrooms at the Army's medical university in Fort Sam Houston, Tex. It's a mammoth plastic model of the human mouth with removable teeth and other sections to show jawbone and tissue structure. It's used to aid tech-

The giant models are designed to do what a magnifying glass would do—blow up hairspring-sized working parts of small military equipment so they can be viewed and understood by whole classrooms of students.

At the other end of the scale are tiny prototypes of tremendous pieces of equipment that never could be brought into a classroom. Overcoming the limitations of

Models Teach Our

For demonstration purposes, a wooden enlargement of standard U.S. M-1 rifle takes and ejects wooden bullets





U. S. Army Photo

Squad leaders practice calling firing order as the instructor flashes varicolored lights on a poster target

time and space, many of these accurate, small-scale prototypes would delight the heart of a model fan.

At the Navy's Special Devices Laboratory in Sands Point, Long Island, there's a center section of an ocean-going freighter which measures about eight feet from hull bottom to the top of the tallest crane. By turning cranks that activate winches on the Lucite deck, cargo-handling classes can

maneuver the deck cranes, pick up pepper-grinder-sized barrels or toy crates from a miniature wharf and stow them in the hold while the instructor watches through the transparent hull to see if they're doing it properly.

The structural parts of a miniature destroyer, 20 feet long, are made of clear plastic so student engineers can see the various steam, fuel and air systems, which

Fighting Men

By Richard F. Dempewolff

Rear projection booth makes it possible to show Army training films to troops outdoors during field maneuvers





Huge "mouth" with removable parts showing bones and tissue aids dental-technician training

tiny coils of barbed wire, matchbox-sized pillboxes with match-sized guns sticking from their ports, tiny tanks that shoot fire from miniature flame throwers, sponge trees and hedges, and miniature villages that would do credit to an HO-gauge railroad layout. Other tables have entire cities on them, complete with model stores, factories, churches and streets. As the students lay down

are indicated by dummies in true scale and contour. On the six-foot bow of another destroyer, in mooring problems seamen operate little hand-cranked winches to raise and lower 10-inch scale-model anchors. In Navy classrooms, men flick the slide on tiny pocket blinkers, flashing messages back and forth at each other across the room as they would with the big signal lights aboard ship.

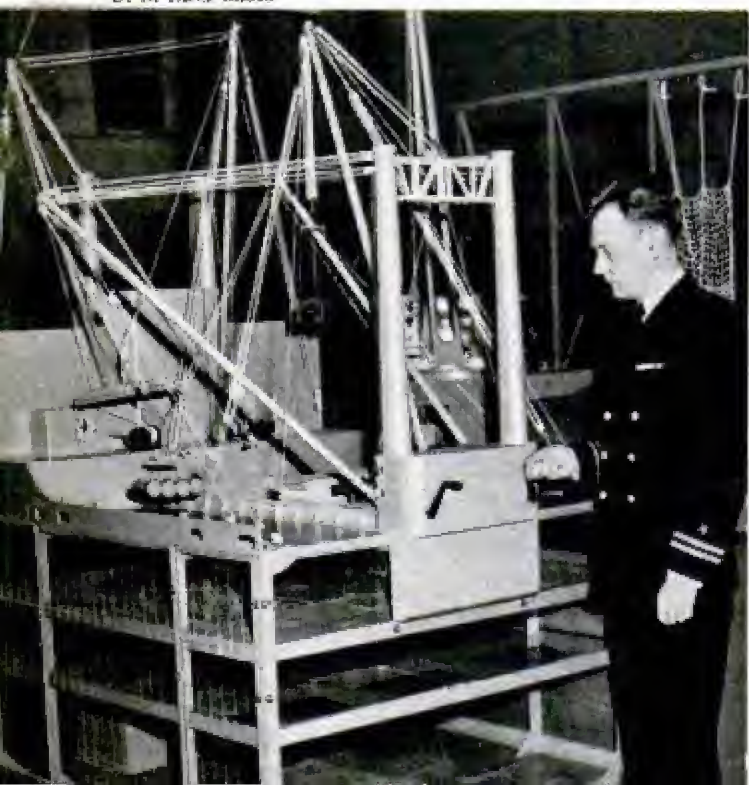
Down at Fort Benning, at the Army Infantry Training Center, entire battlefields and complete villages are reproduced in miniature on sand tables to save time and money that otherwise would be required in moving live companies to demonstrate logistical problems and tactical situations.

Classes move theoretical assaults across entire training areas reproduced on tables measuring about 30 feet square. There are battlefields with 1/2-inch-high tank traps,

their theoretical barrage, a man under the table pulls strings that activate a series of flaps on the board. Here and there an X pops up to show that the boys have wiped out a building. A flap in the form of a cloud of smoke obliterates "Main Street," to indicate that the forward observer has hit it "on the nose."

Throughout the services, these models are doing a yeoman job of training in conjunction with an array of other new aids, like the portable classroom recently developed by the Signal Corps. Packed in a case no larger than a regular traveling bag, the classroom consists of a roller-operated series of charts for lectures. The instructor sets it up in two minutes out in the field and reels a series of several dozen charts in front of his soldier audience as needed. Another innovation is the field moving-picture projection booth for daylight viewing.

Realistic cranes, working on model of center section of a freighter, simplify cargo-handling instruction
U. S. Navy photo



Giant-sized versions of spark plugs and carburetors help GI mechanics understand how an engine runs



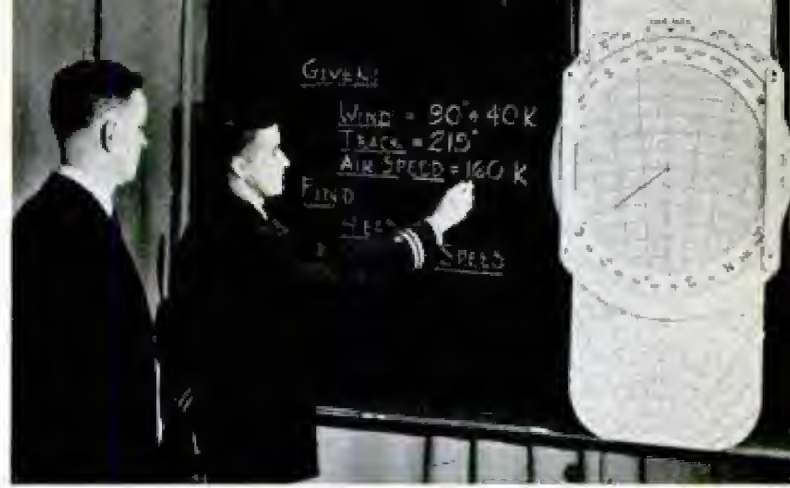
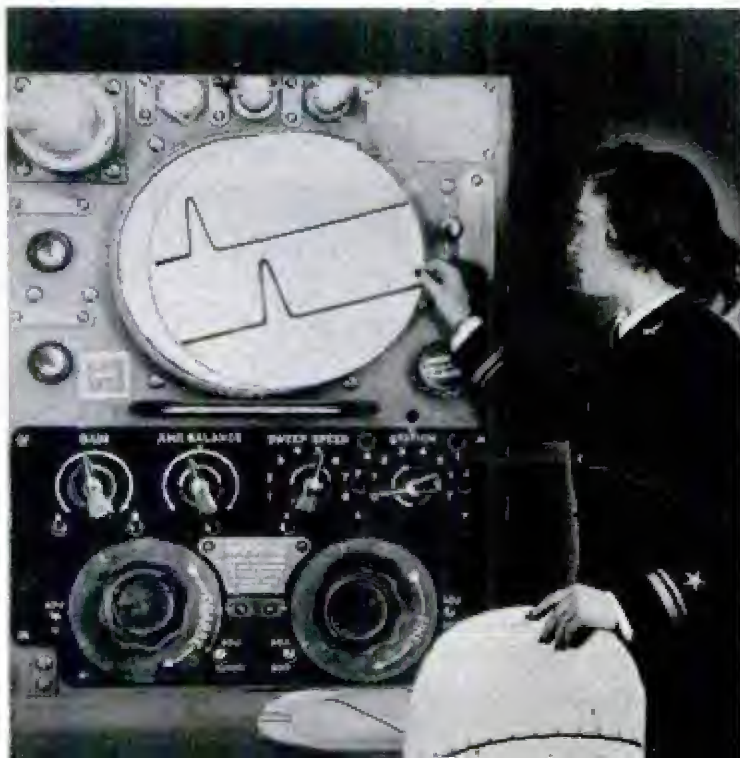
Made of 1 by 2-inch framing and wallboard, it can be set up in five minutes. It measures 4 by 6 by 10 feet when assembled and projects 16-mm. film from the rear of the booth to a three-foot viewing screen that faces the field class.

Air Force student navigators learn to identify the "signposts" of the sky with a portable and comparatively inexpensive planetarium. The "sky," on which all important stars through the fifth magnitude are projected, is a hemispherical screen that looks like a beach umbrella suspended from the ceiling. Beneath it is a globelike projector that can be adjusted to show how the night sky looks from any spot on earth at any time of year.

And out at Camp Atterbury, Ind., flashing lights on a painted panel are helping Army riflemen learn squad tactics. The 5 by 15-foot board is covered with a landscape sketch having colored lights at various points. The instructor switches on the lights in any order desired. Each light represents one type of enemy armament—for example, a red light is a machine gun and an orange light a single rifleman. Members of the training squad take positions in front of the panel. When the instructor flashes a certain bulb the squad leader must give the proper fire order, designating the range at which men are to fire on the target. If he gives the wrong order, another light flashes on and he must now correct the original order and give a new order to solve the more difficult problem.

In all the new training aids emphasis is on simulating reality so that when he's confronted by the real thing, there will be no doubt in the mind of the modern serviceman as to what to do and how to do it.

With an enlarged Ioran indicator as a prop, a WAVE instructress explains the various patterns of the scope



Actual dead-reckoning computer would fit in pocket, but this four-foot model is much easier to explain



Even students in the rear seats at lecture halls can see every detail on this blowup of small radio panel

Navigator trainees cluster around the mockup of an astrocompass, shown actual size in the foreground
U. S. Air Force photo





Gopher Exterminator

Compressed air is being used by the U. S. Bureau of Reclamation to kill gophers. They potentially cause thousands of dollars in damage through canal breaks on federal projects. Developed by William A. Batzner, the method employs calcium-cyanide powder. Fine particles are blown by compressed air into the runs dug by gophers where, upon exposure to moisture, they release hydrocyanic acid, which kills gophers instantly. Batzner mounted an old compres-

sor on a Jeep to make the outfit portable. He then attached 50 feet of $\frac{1}{4}$ -inch rubber hose to the air supply and installed an improvised metal chamber at the other end of the hose to hold the powder. Inside this chamber a valve controls the amount of air that may enter, thus regulating the amount of powder that leaves the chamber each time air is admitted. In front of the valve is a jet which releases air into the powder, while behind the valve is a small hole through which air and powder are blown into the hose inserted in the gopher run.

Synthetic Gravel

Mud can be transformed into "gravel" through a process developed at Cornell University. The technique may solve special road-building problems in areas where gravel is scarce. The synthetic gravel is made by mixing mud with inexpensive chemicals and sulphite liquor, a waste product of the paper industry. The material is fused into lumps and the lumps then are broken to resemble crushed rock. In tests, the gravel has been submerged in water for six months without disintegrating, and has withstood freezing and drops from a three-story height.



Air Becomes Efficient Weapon for Fighting Fires in Oil Tanks

Ordinary air is the latest weapon for fighting fire. In a new technique for extinguishing fires in oil tanks, air is forced into the bottom of the tank. As it rises to the surface it agitates the contents, bringing cold oil from the bottom of the tank to the burning surface and decreasing the vapors which aid combustion. Fire-fighting foams

do the rest of the job. In one test of the process, developed by J. L. Risinger of the Socony-Vacuum Oil Company, a fire in a tank holding crude oil was under control in 45 seconds. The technique also extinguished a fire in a tank holding 100,000 gallons of kerosene. The method may also be applied to oil tankers at sea.



German Model-Plane Builders Follow Sweptback-Wing Trend

Variety is the spice of design for the only air fleet Germany now has in place of its once-powerful Luftwaffe. Prominent among the newest model-plane designs at West

Berlin meets are sweptback wings, like those featured in the Boeing Stratojet bomber, and the clean lines of the British Canberra's fuselage.

"Silent" Organ Has 24 Keyboards

Although 24 persons can play at the same time, not a sound is heard from an electronic organ unless the listener is wearing earphones. Invented by a British science teacher, the organ permits a group of students to practice simultaneously without interfering with each other. The teacher can listen to any one of his pupils simply by plugging in his earphones to the desired keyboard. The pupil hears only her own playing through her earphones, unless the teacher wishes to correct mistakes by playing the correct version on his own keyboard. Then the pupil's earphones are connected to the teacher's keyboard. All 24 keyboards are supplied by one tone and amplifier unit.

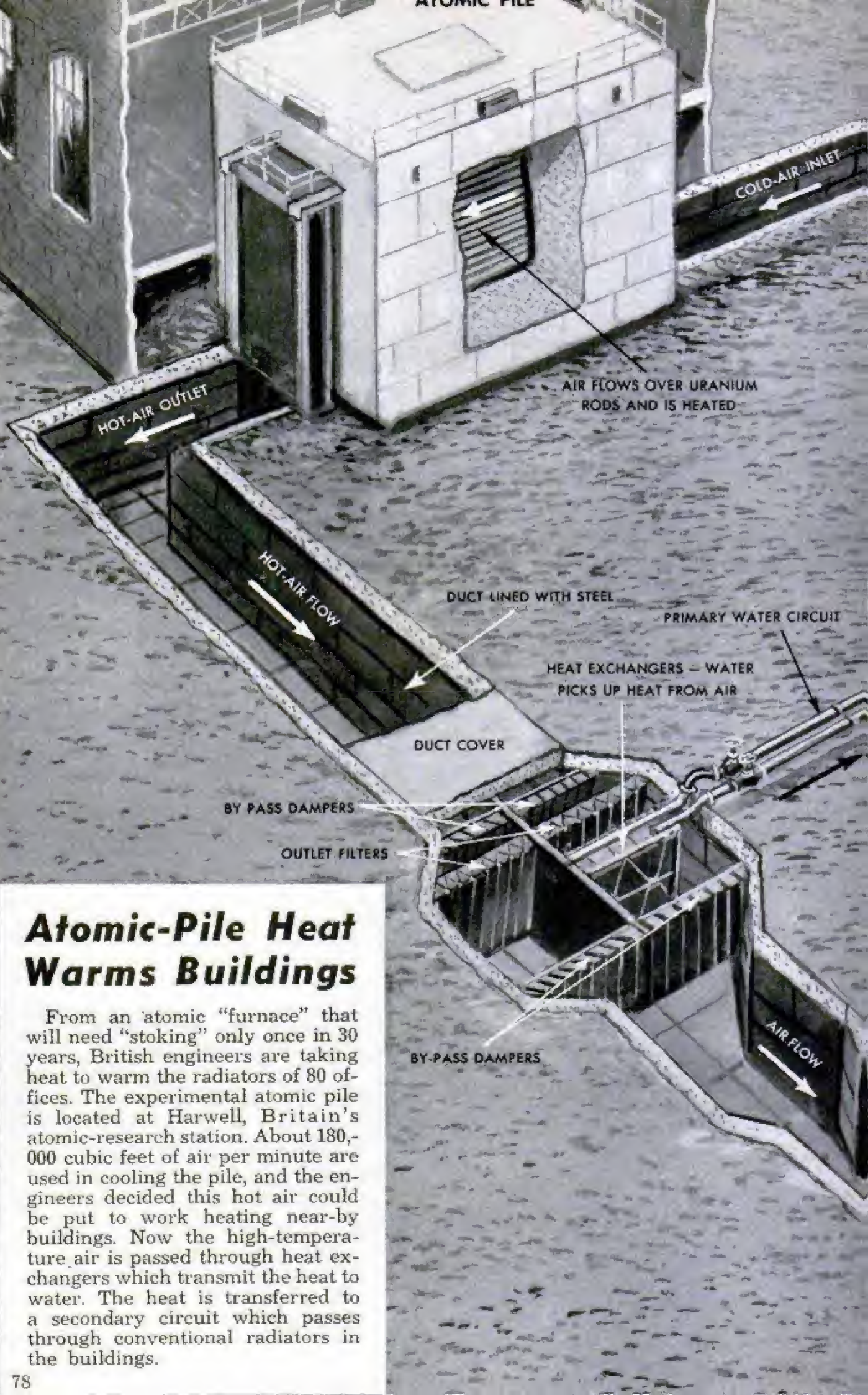


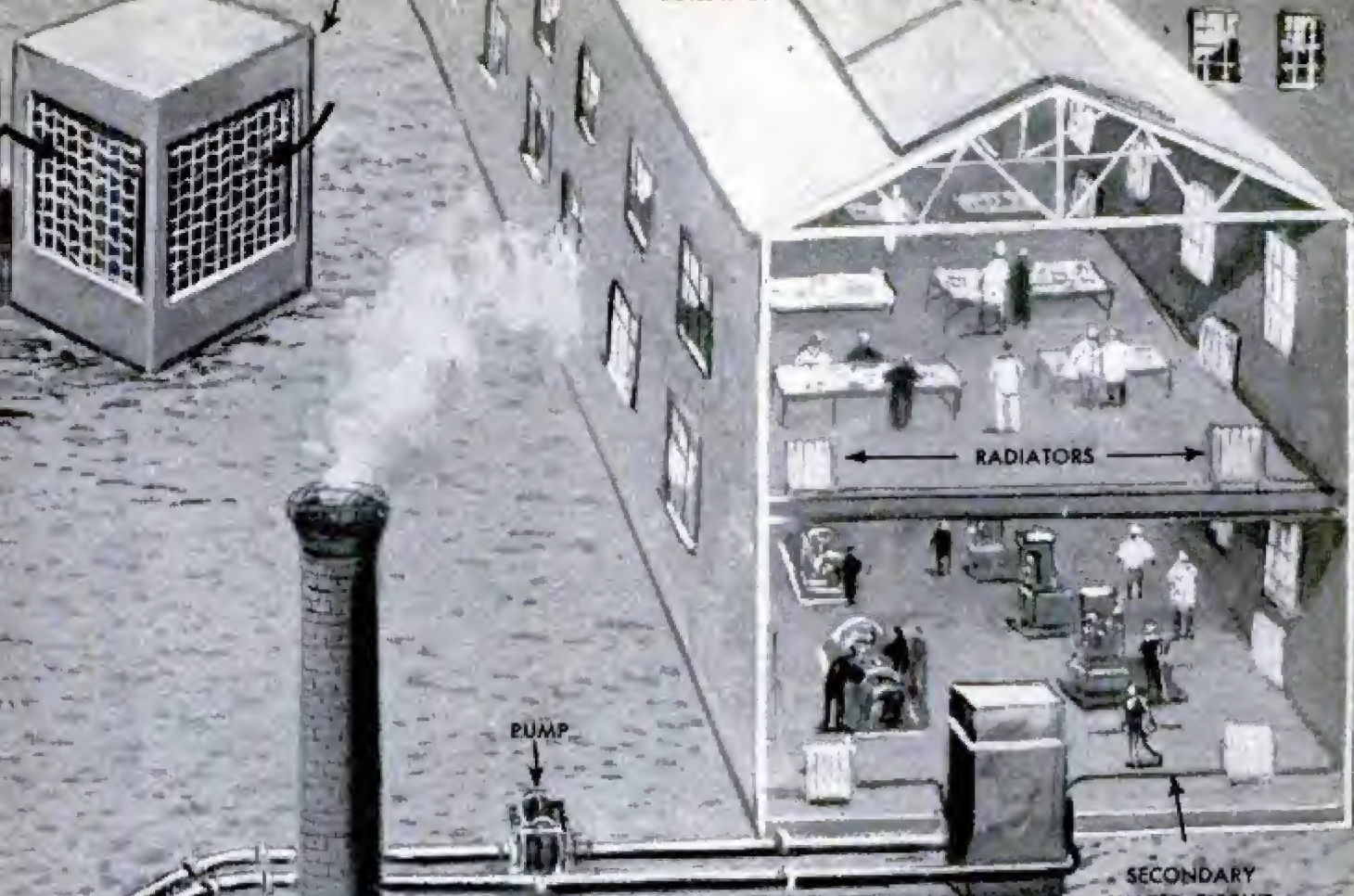
☐ Los Angeles County leads all others in the U. S. in truck registration with 174,731 vehicles. Five Boroughs, New York, is second with 129,482, and Cook County (Chicago) is third with 109,634, according to the Automobile Manufacturers Association.

If you do not find the information you need in the index on pages 12, 14 and 16, sources of further information are available without charge from *Popular Mechanics*. Write to the Bureau of Information, 200 East Ontario Street, Chicago 11

Atomic-Pile Heat Warms Buildings

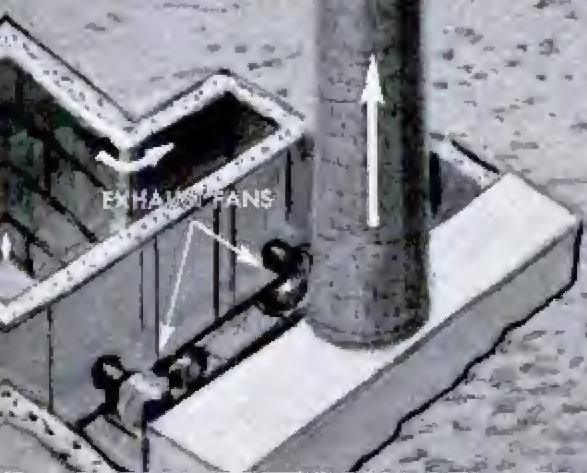
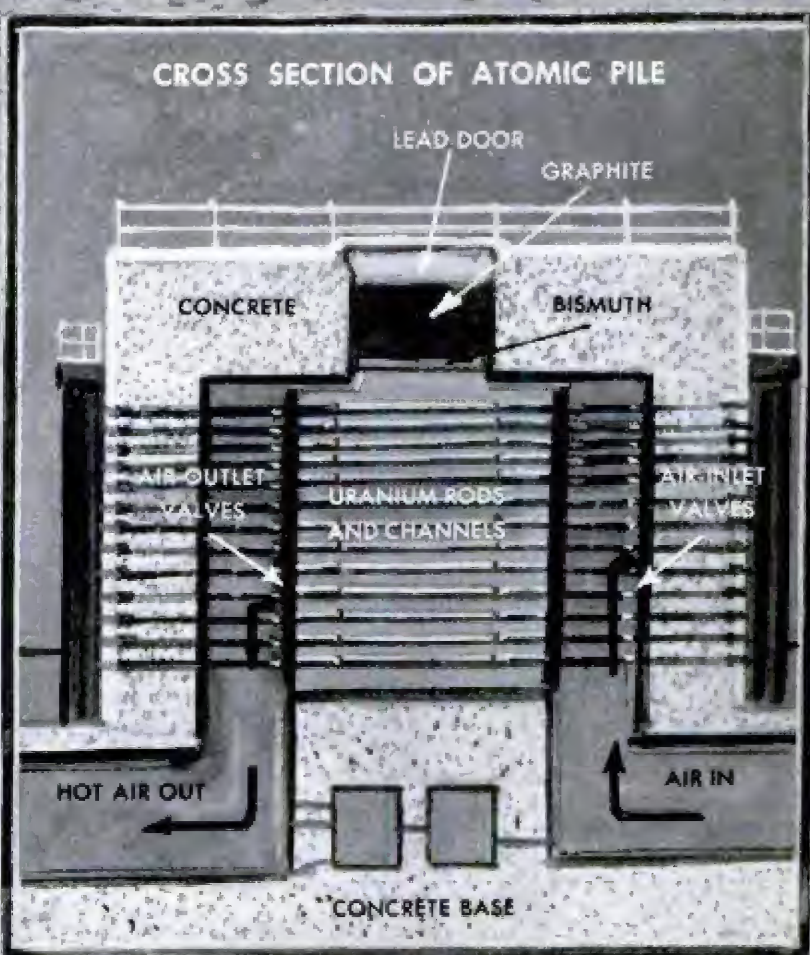
From an atomic "furnace" that will need "stoking" only once in 30 years, British engineers are taking heat to warm the radiators of 80 offices. The experimental atomic pile is located at Harwell, Britain's atomic-research station. About 180,000 cubic feet of air per minute are used in cooling the pile, and the engineers decided this hot air could be put to work heating near-by buildings. Now the high-temperature air is passed through heat exchangers which transmit the heat to water. The heat is transferred to a secondary circuit which passes through conventional radiators in the buildings.





USED AIR DISCHARGED
UP 200-FOOT STACK

G.H. JAVIS
1952





Pulse Jets Power Glider

Flight tests of a small pulse-jet unit developed in France are taking place beneath the wing of an Emouchet glider. Each jet unit weighs 11 pounds. Two are mounted under each wing, the four providing the

glider with a total thrust of 88 pounds. This is double their total weight. Called an Escopette, the unit has a total length of a little over nine feet, an intake diameter of 7.3 inches and an exhaust orifice of 5.85 inches. No glider launch is necessary when the units are used.

Turntable Eases Garaging

Now Frank Enos of Sausalito, Calif., just presses a button to solve what had been a difficult problem. He lives on the side of a hill, with a garage 30 feet below the level of the road and at the end of a 150-foot driveway. Backing up the hill on wet mornings was sometimes a dangerous chore, until Enos devised a turntable and installed it just before the entrance to the garage. Pressing a button puts a ½-horsepower geared motor to work revolving the table after Enos backs out, and he drives forward up the hill. The turntable



deck is supported by 4 by 12-inch girders and 2 by 12-inch joists which are set on eight concrete piers.

U. S. Air Force photo

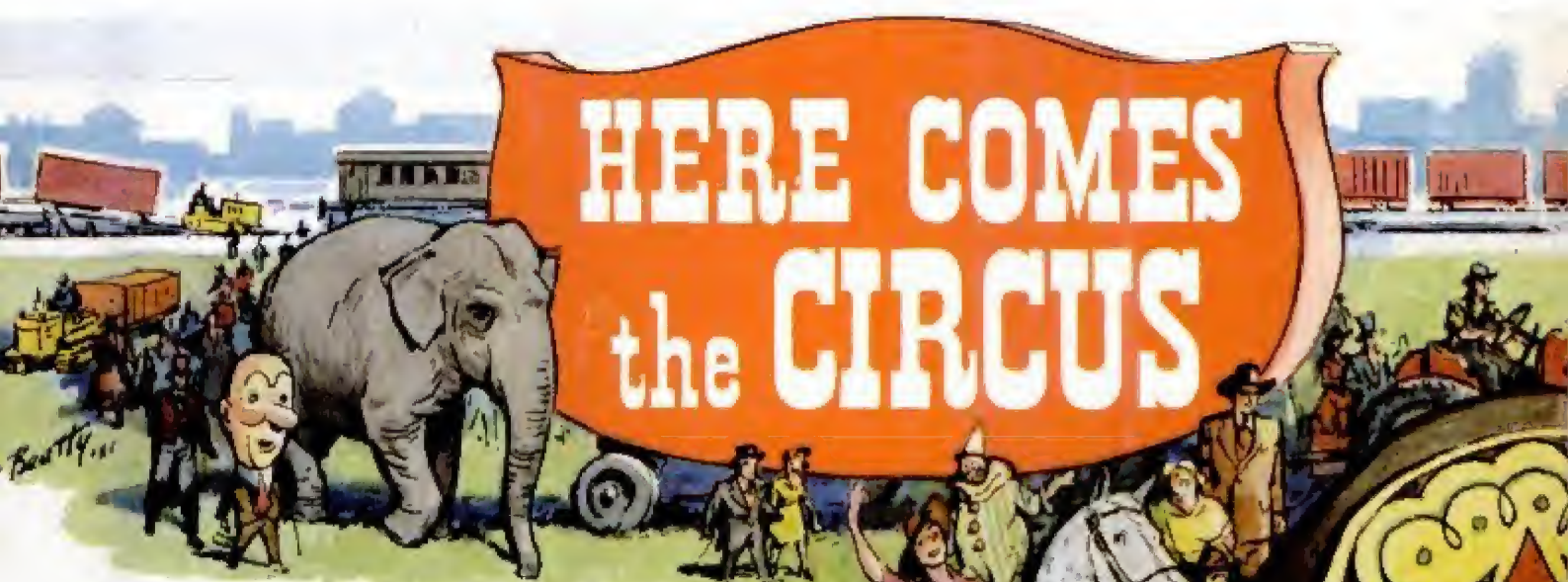


Breakable Hans Helps Air Force

Fractures of Hans' "almost human" bones are expected to save Air Force pilots from similar injuries. Built around a metal, rubber, nylon and ball-joint spinal column, Hans is a dummy the Research and Development Command made to simulate the human body in a series of drop, crash impact, deceleration and acceleration tests. Through a cylinder and sleeve arrangement his arms and legs rotate exactly like a man's. He has the measurements of a muscular 200-pounder. The dummy's metal and plastic collarbones, the most easily fractured bones in humans, will snap just as would a man's, and his vinyl-foam "skin" will show the effects of cuts or abrasions. Following each test the bones can be studied or replaced through zippered openings in the skin.

☐ Tetraethyl lead, the antiknock for gasoline, can now be made radioactive which may enable scientists to solve the mystery of what happens chemically to fuel when the compound is added to it.

Three trains haul the "Greatest Show on Earth"—72,000 tons of it—to three million spectators each year



By Clifford B. Hicks

Illustrated by Frank Beatty

ABOARD *The Flying Squadron*, Lloyd Morgan nurses his wake-up cup of coffee and watches the scattered lights on the edge of town parade across the window. The circus train slows, then stops with a jolt that sloshes steaming coffee over the rim of the cup. Swearing mildly, Morgan heads for the front platform.

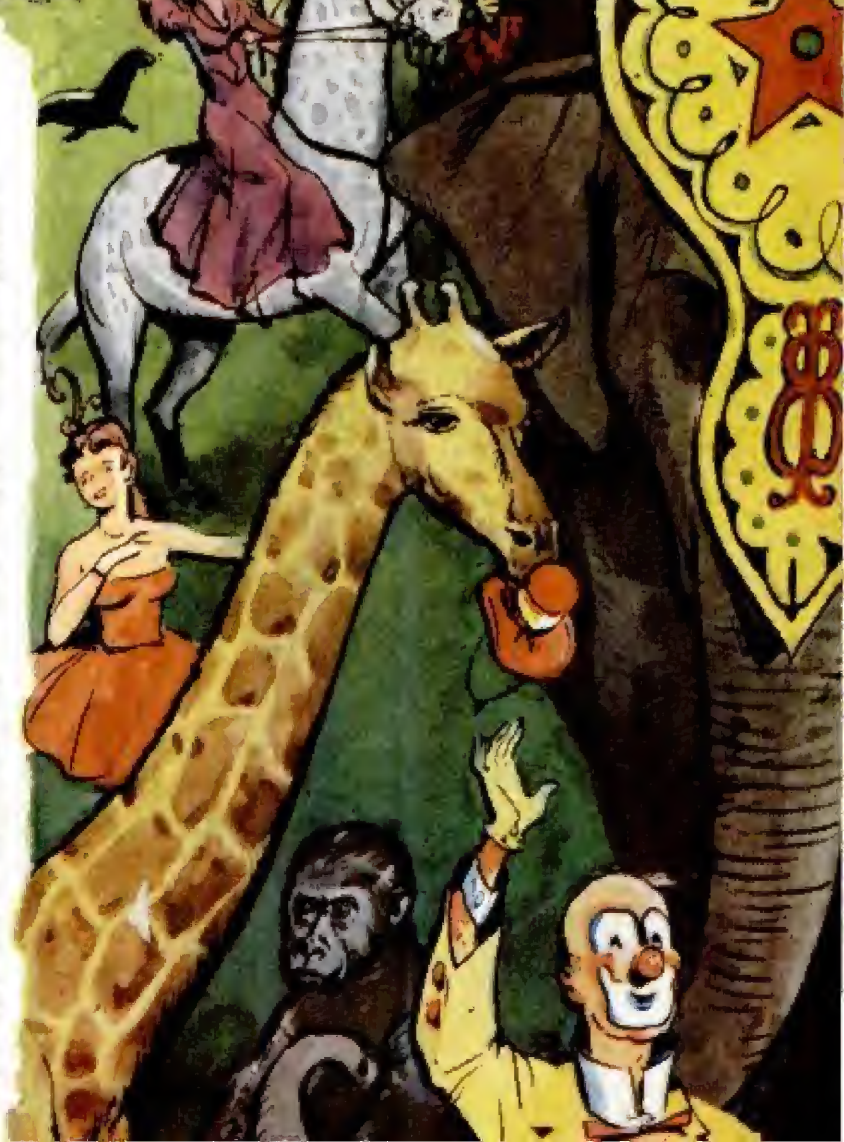
In the half-light of dawn, a hundred men swing off *The Flying Squadron* and stumble beside him up the railroad ties. At the entrance to the lot stands L. D. "Doc" Hall, the 24-hour man. Morgan strides over, moving briskly for a big man.

"How does she look, Doc?"

"Big and dry. There's plenty of room for a 'Yankee Robinson.'"

A few steps away, a 12-year-old rubs sleepy eyes and waits respectfully for a chance to hit Morgan for a job (wages—a free ticket to THE GREATEST SHOW ON EARTH). With the kid at his heels, Morgan walks across the gray softness of the lot.

For days, Morgan knows, the kid has been gazing sparkle-eyed at the brassy billboards announcing the one-day stand of



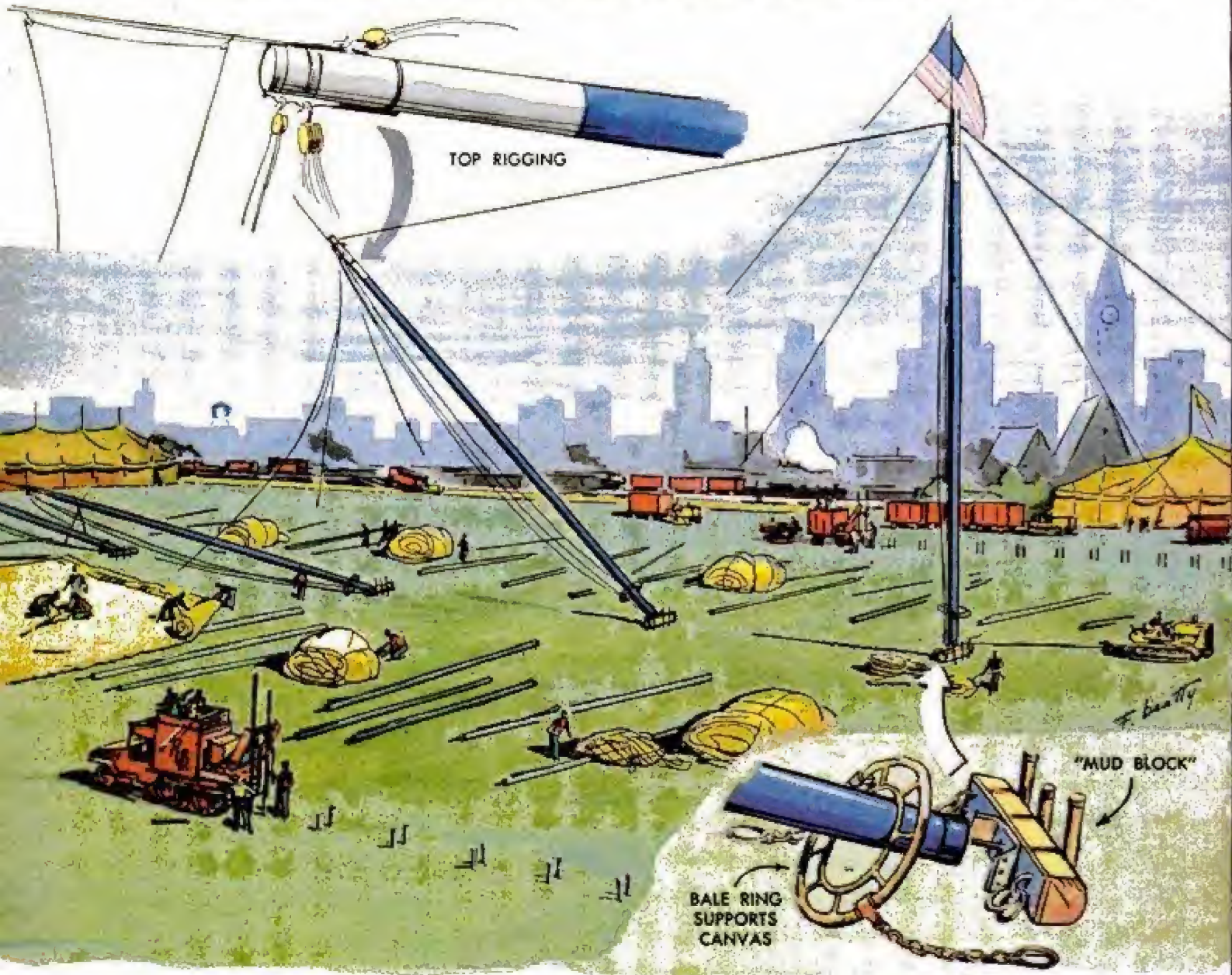
ELECTRICIANS, SAILMAKERS

27 ELEPHANTS

LIGHTS, PROPS.

EXECUTIVE STAFF, AGENTS, SIDE-SHOW PERFORMERS

Below, Number One pole, already towering 62 feet above the lot, acts as a skyhook to raise the other poles. Pivoting on a half-round timber against a "mud block," the second pole sways slowly and regally into position



Ringling Bros. and Barnum & Bailey Circus. Actually, there's a misstatement in the printed ballyhoo: The Greatest Show On Earth isn't the prodigious production under the big top, as advertised, but the spectacular sight of a vast canvas city going up at dawn, then melting away for another year barely 18 hours later.

It's Morgan's job as lot superintendent, to see that the world's biggest circus appears, pauses, then vanishes as smoothly as

a rabbit in the hands of the side-show magician. Even to Morgan it's a feat of legerdemain. Packed inside *The Flying Squadron* (first section of the circus train) and its two gaudy running mates are some 72,000 tons of circus, from ponderous pachyderms to gawking giraffes and the rarest of animals from every clime. There are people aboard, too — 1400 of them — from the Fat Lady with her 540 (count them) pounds to the star aerialist and lowliest

BIG TOP GEAR

SEAT WAGONS - COVERED WITH COLLAPSIBLE SEATS

SEAT WAGONS - CIRCUS CAN SEAT 8000 PEOPLE

canvasman. Through split-second timing, under the direction of Morgan and the other boss-men, they are able to erect their vast patchwork city for about 430 performances before three million spellbound spectators each year.

And here's the whole spectacle, capsuled into this one-day stand in the sleepy-eyed kid's home town, a miracle of movement, the show behind the show, a sight well worth an alarm clock at dawn.

Pretending he doesn't see the kid, Morgan sets briskly about the business of staking out the circus with flag-tipped metal poles. There's a full 18 acres of room on the lot so he plots a Yankee Robinson, a straightaway layout with the midway, side show and big top visible to the customers, all the rest of the circus staked out in the privacy of the "back yard." On the vast grassy field, under the excited eyes of the 12-year-old, he pegs down the location of every single item now crammed aboard the circus trains.

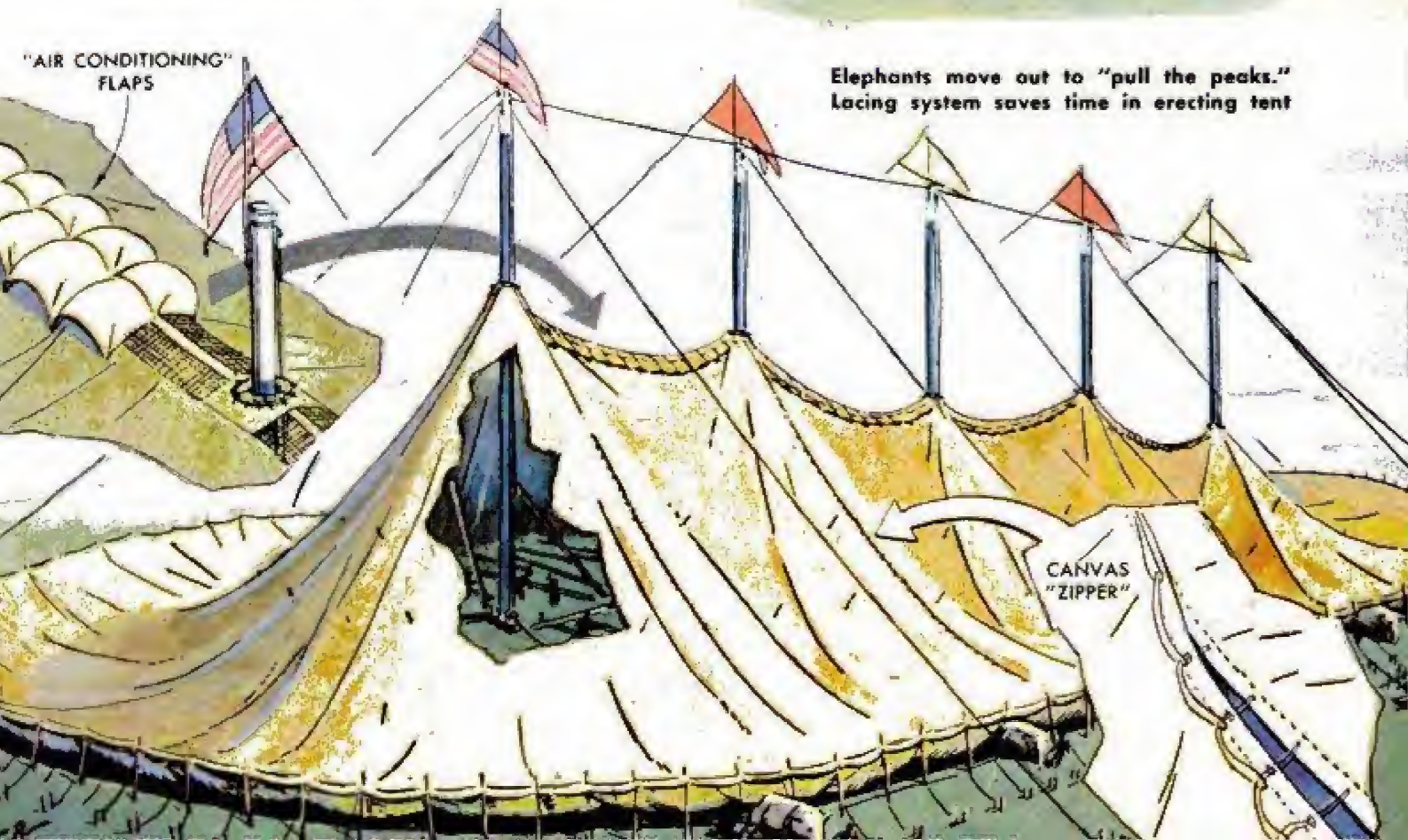
The gaudy trains themselves are a spectacle to tingle the spine of boy or man. Of

Below, tough old elephant moves sedately beneath the sagging canvas, pulling the quarter poles upright



"AIR CONDITIONING" FLAPS

Elephants move out to "pull the peaks." Lacing system saves time in erecting tent



BIG TOP POLE WAGONS, STAKES, 20 TONS OF CANVAS

the 69 railroad cars in the three trains, 49 are superlong (72-foot) flatcars. On these flats are 191 garish wagons, anchored end to end. Spotted strategically among the wagons are 27 "cats" and farm tractors which will pull them down the ramps.

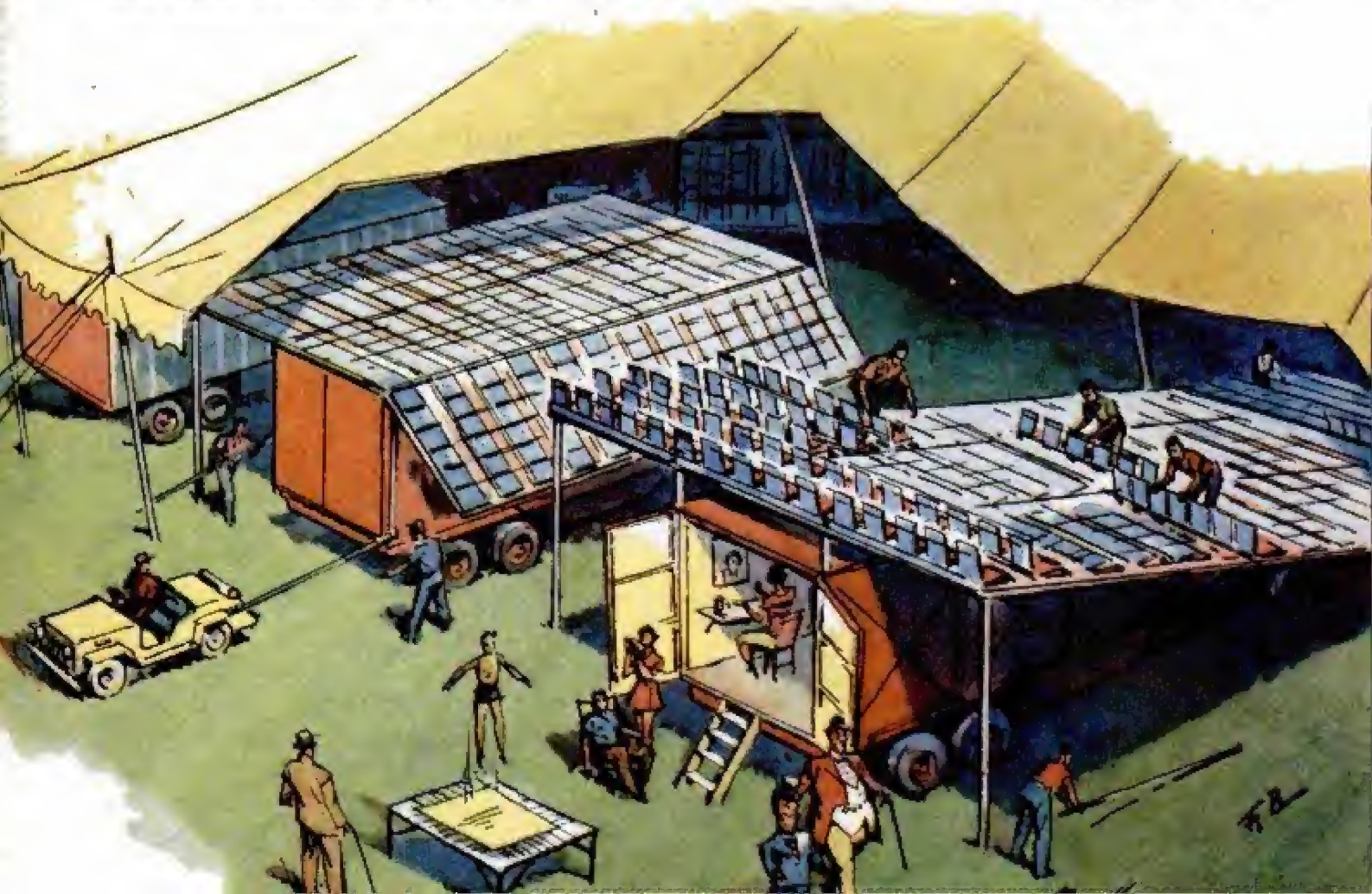
In *The Flying Squadron*, first to pull into the siding, Morgan and trainmaster Paul J. McClane have three horsecars (with folding stalls for 96 horses), two big stockcars (containing 144,000 pounds of elephant) and a parade of wagons containing the menagerie, kitchen, cookhouse, blacksmith shop and other service departments.

Close on the caboose of *The Flying Squadron* rolls the second section toting the big top itself, and bringing up the rear in the third section are 16 of the 26 seat wagons which soon will erupt into a huge amphitheater. Scattered throughout the three sections are 23 coaches; once Army hospital cars, they're now air-conditioned homes for circusfolk.

Gen. mgr. Arthur M. Concello, Morgan's boss, has a working crew of 1400 troupers, organized right down to the TINYTOWN MIDGETS, to erect the circus with the precision of an assembly line. Coordination is the secret of the circus' mobility. The show-folk are divided into special working crews, from property department to stables, the big canvas department to the iceman, the usher department to the veterinary. There's even—believe it or not—a chameleon department, highly organized and staffed with "bug men" assigned the sole responsibility of feeding, packing, moving, unpacking and hawking their miniature dragons through the big top daily.

Morgan finally takes pity on the kid at his heels and gruffly sends him off to find George Werner, canvas boss. In his search for Werner, though, the lad is delayed by a gang of "razorbacks" unloading the train. Along the tracks huffs a switch engine, cutting *The Flying Squadron* into two parts.

Seat wagons are hauled into position, their flaps cranked up and the 8000 seats slammed upright by ushers



The split is made between two special "run cars." Then, swarming like hornets, almost knocking the lad over, a crew of razorbacks heaves four steel ramps off the run cars. Out of nowhere appear two "polers"—heavy-set boss-men who direct the unloading of all three trains.

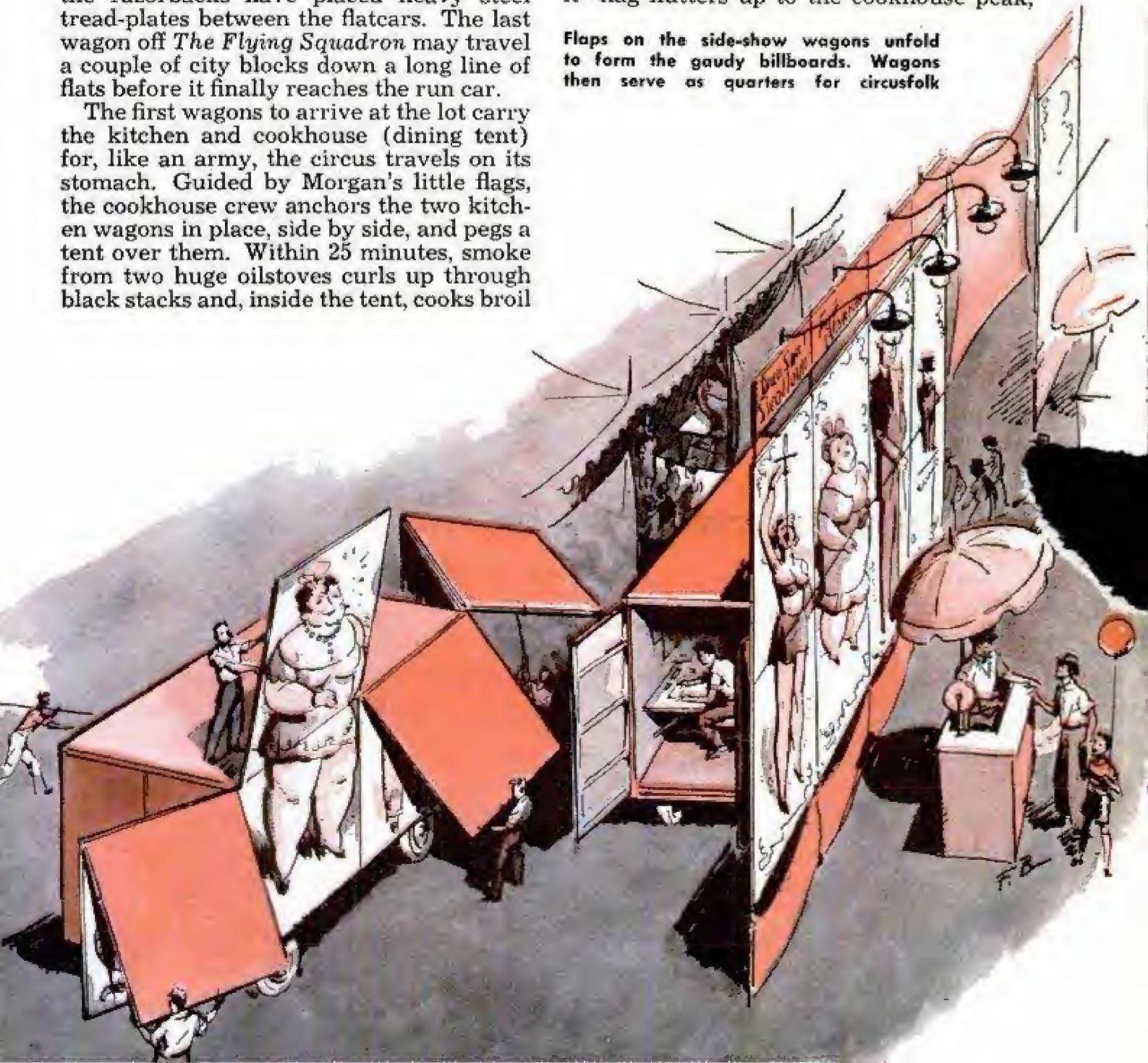
Then starts the modern circus parade—the procession off the train. Caterpillar tractors snarl down ramps towing bright, mysterious wagons. At the circus lot they drop their loads, pivot on a peanut shell, and race back to the siding where they wait for the poler's signal, then scurry up the ramps to pick off other wagons. Meanwhile the razorbacks have placed heavy steel tread-plates between the flatcars. The last wagon off *The Flying Squadron* may travel a couple of city blocks down a long line of flats before it finally reaches the run car.

The first wagons to arrive at the lot carry the kitchen and cookhouse (dining tent) for, like an army, the circus travels on its stomach. Guided by Morgan's little flags, the cookhouse crew anchors the two kitchen wagons in place, side by side, and pegs a tent over them. Within 25 minutes, smoke from two huge oilstoves curls up through black stacks and, inside the tent, cooks broil

mountains of bacon and scramble eggs by the thousands. Parked near by are the refrigerator car and a wagon containing—hold your hat, Mr. Barnum—a gigantic automatic dishwasher.

Meanwhile, the 142-man cookhouse crew has fallen upon its 14 red wagons. Poles and canvas are flopped into position. The 56 by 200-foot dining tent is larger than the big top of most other circuses. Even before the canvas is pulled to the peaks, its cavernous interior resounds to a drumfire clatter as waiters slam together the 100-odd collapsible picnic tables. Two hours after the circus pulled into town, the "come and get it" flag flutters up to the cookhouse peak,

Flaps on the side-show wagons unfold to form the gaudy billboards. Wagons then serve as quarters for circusfolk



and within the next 12 hours the world's largest land-traveling restaurant will serve 4200 top-notch meals to the "kinkers," razorbacks, performers and workers of the show.

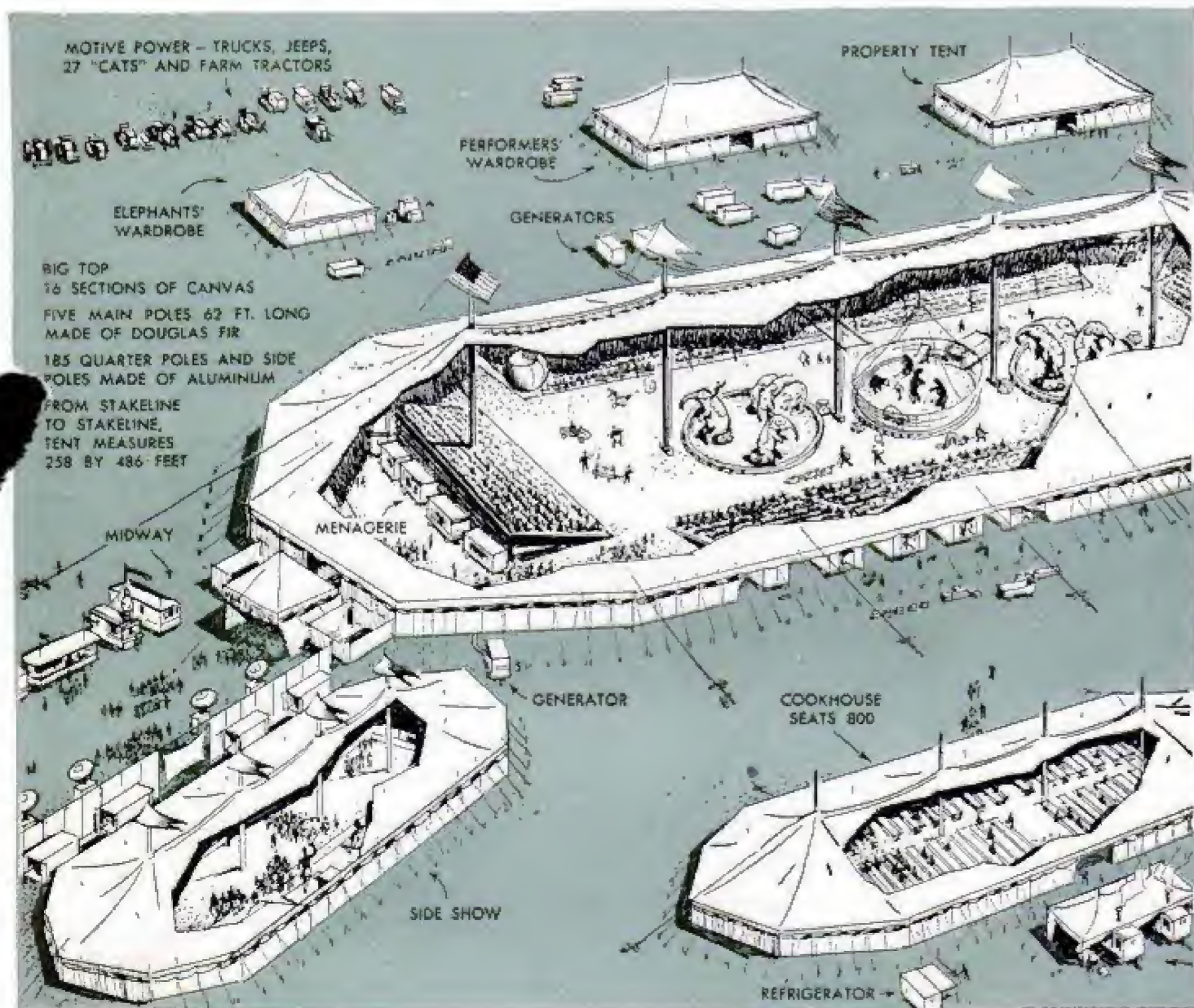
With *The Flying Squadron* unloaded, the second section is switched into position and split at the run cars. Off the train roll wagons bearing the big top itself, largest tent on earth. Over on the grassy lot Morgan has measured to the inch the exact location of each of the five main poles, for the "top" shrinks or stretches as much as five feet in either direction, depending upon the weather. Today he has marked off a huge oval stake line measuring a thumping 486 feet long and 258 feet wide, an area more than twice the size of a football field.

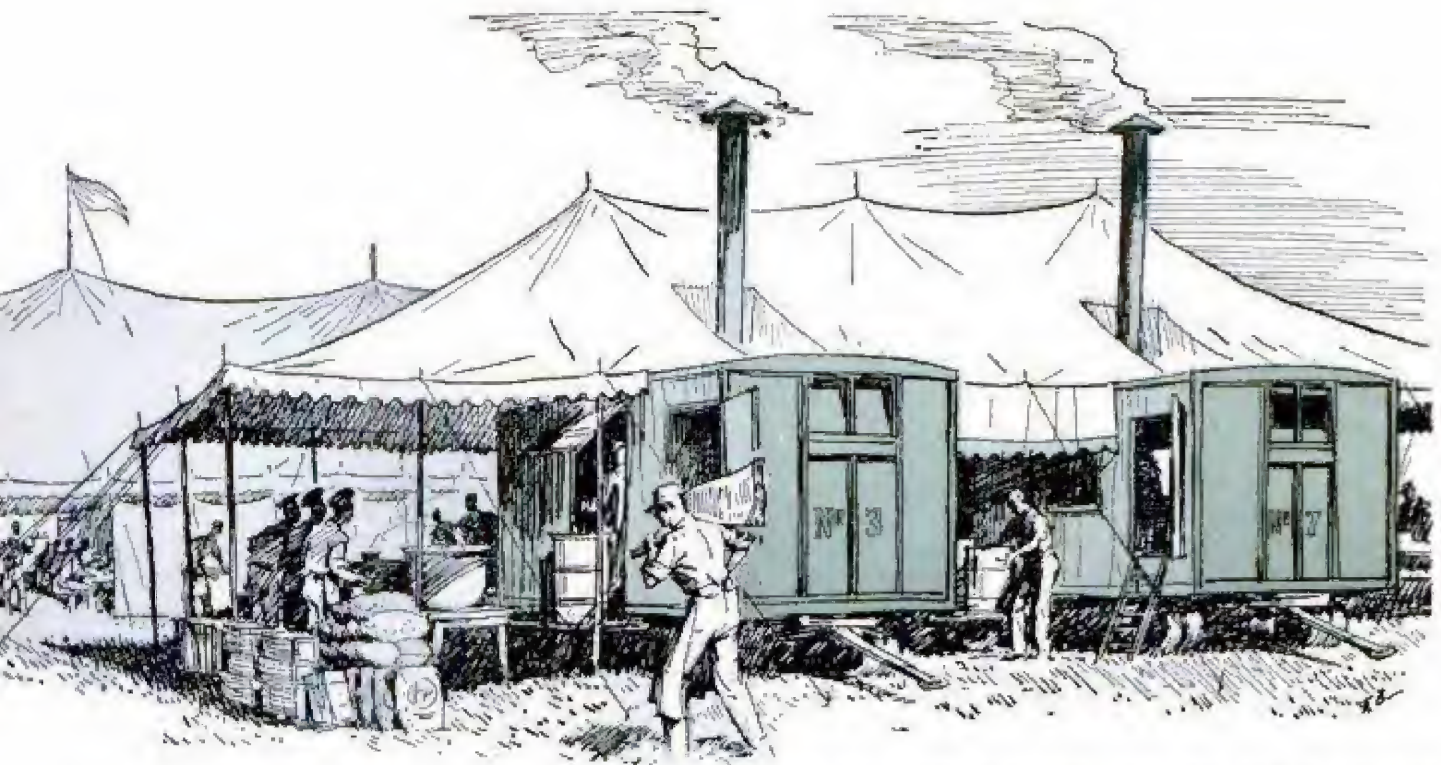
Around the perimeter of this oval crawl two huge stake drivers, one mounted on a converted Army half-track (the flashing sledges of yesteryear have all but vanished in the mechanization of today's circus). Two miniature pile drivers on the rear of the vehicles beat an unending tattoo, slamming the four-foot stakes into the

ground. And down the center of the oval marches a smaller stake driver, mounted on a Jeep, which pounds home the stakes that hold the big center poles in place.

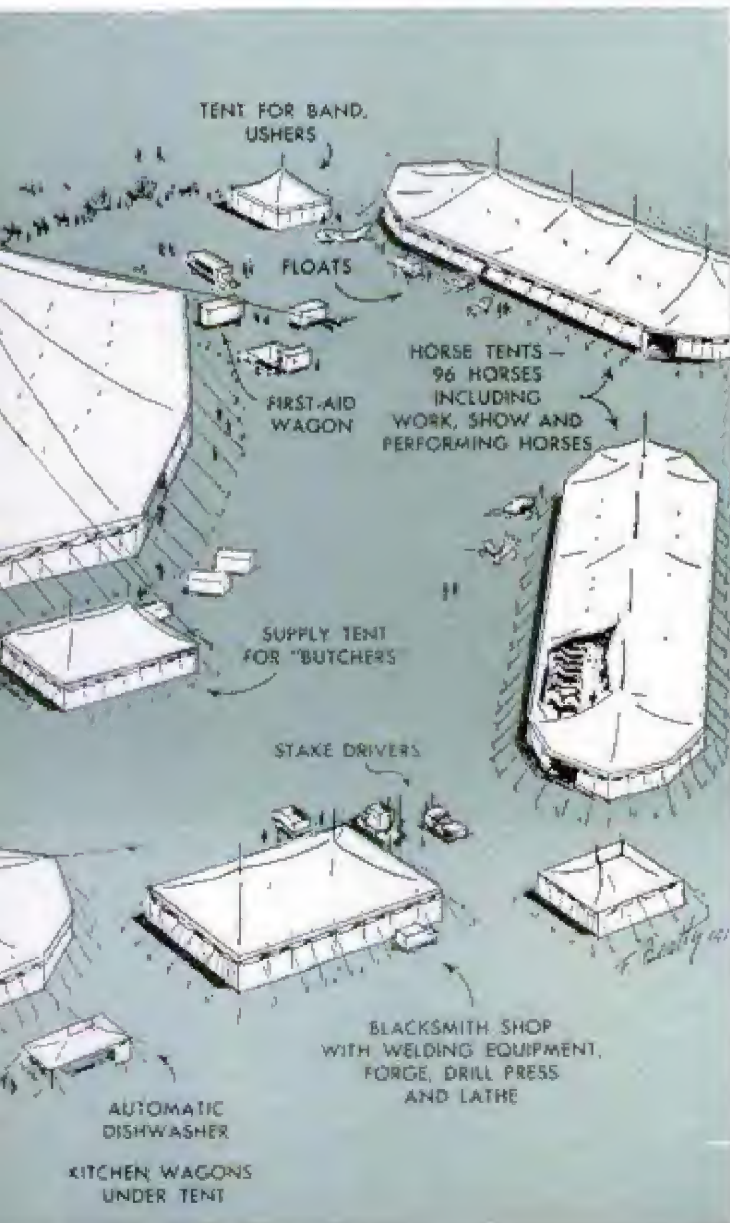
Now along the center line rolls the long pole wagon. As it arrives at each position, one of the five 62-foot main poles teeters off onto two crossarms which cradle it with the base just off the ground, the top several feet in the air. A crew of canvasmen slips a three-foot bale ring onto the bottom of the pole. Soon this ring will rest at the very top of the vast tent, supporting not only the canvas itself but much of the rope and tackle that rig the big top. Meanwhile 185 aluminum quarter poles and side poles thud to the ground all over the staked-out oval.

Number One, the first pole up, is the key to the entire top; it helps raise and lower the others, gives canvas boss Werner a hook high in the sky. First, though, it must be pivoted into place. A 2½-inch hawser, fastened to the top of Number One, runs out to the edge of the oval where it's tied to a heavily staked block and tackle. As a





Kitchen wagons, with tent pitched snugly over them, contain two oilstoves which turn out 4200 meals a day



cat sputters into position and picks up the rope, an undercurrent of tension, a half silence, seems to fall across the lot, for this is the one ticklish job of raising the big top each day. The cat claws forward and Number One pivots slowly and regally into the air, swaying now and then, guy lines jerking it back on course. When it stands straight and true, an American flag flutters up toward its peak. Though no one says a word, the kid watching from the side lines has a feeling the circusfolk have uttered a vast, collective sigh.

Meanwhile, under Werner's sharp eye, the 76,000 yards of flameproof canvas have been dropped piecemeal around the oval. The vast cloth roof is bright-new when the circus leaves winter quarters each spring. By midsummer it's faded and patched.

The kid by now has found Werner and begged a job on a canvas crew. Under the rough direction of the crew boss, the men attack one of the big pie-wedge sections, unfolding it, dragging it into position, then lacing it to the adjoining section. Three canvasmen finally strap the tent to the bale rings at the bottom of each pole. Then the kid tags after the men as they move off the canvas, where, emulating them, he grabs a guy line, holding in his hand a few inches of the 73 miles of rope that hold up the circus.

Werner waves his hand in an almost unnoticeable gesture, an order that somehow flashes instantly around the oval. Workers, moving as one man, slip the side poles into

(Continued to page 220)

Typical "Yankee Robinson" layout steers spectators along the midway at far left, then past menagerie into big top. The rest of the layout is the "back yard" for exclusive use of performers and workers



Detroit Listening Post

By Siler Freeman

SHORTAGES of new cars are not expected to develop this year. Relaxation of quota limitations for the second quarter plus higher prices for the 1952 models about eliminates the possibility that the post-World War II and Korean War scare situations will be revived.

Industrial circles are predicting that in the next few months, unless the defense program is given greater impetus than at present, government limitations on production and most materials will be only academic. This, of course, would stimulate even greater production of new cars and lead to a situation where the dealers would be forced to get out and seek customers.

The easing of the defense program also has dismissed most of the fears that 1952 would be the last big model-changeover year. Engine programs, held up by the freeze on machine tools, have been revived.

Dodge, close to realization of a V-8 engine similar to the Chrysler FirePower and DeSoto FireDome, is now almost sure of the new engine in its 1953 model. Buick and Pontiac of the General Motors group are pushing ahead with their V-8s for 1953. Packard may be in the same boat, although not so far along as Buick and Dodge.

But the big question today is: "What about Chevrolet?" The top seller in the field has been getting disquieting reports about its 1952 competition.

The new models which Chevrolet had started for 1952 were halted originally by the stepped-up defense program and the feeling that with production cut down, it would not be necessary to go to a completely new car. Later the Chevrolet high command decided it needed more than what was originally planned. So the design section is busy again.

The horsepower race is far from over, too. The increase in power among the higher-priced cars has been going on since V-8 engines became the standard. This year Cadillac is on top. But will it stay there?

It is evident that Chrysler is not satisfied to have its archrival advertising 190 horsepower while its own big power plant has only 180. A paper read before a recent Society of Automotive Engineers meeting

here by James C. Zeder, director of Chrysler engineering and research section, indicates the thinking of the corporation.

Zeder told of experiments with Chrysler's V-8 which have yielded as high as 353 horsepower. The compression ratio was stepped up above 12:1 and a very high octane fuel was used, Zeder said.

But even with standard compression ratios and regular fuels, he revealed a second engine which went over 300 horsepower. It is inconceivable that such an engine would go into any production model but the thinking is for more horsepower.

I recently asked William Graves, Packard's engineering chief, why such high power was being sought in automobiles when traffic conditions and highways were not yet ready for 100-plus-miles-an-hour speed. Graves said:

"It is true we haven't the roads to drive at such speeds, nor are other factors in balance yet to seek speeds in that range. But when you are paying around \$5000 for a car, you want an engine that will get away faster than the other fellow.

"With these big engines there are other problems which face the engineers. First, we must have brakes that go with the 100-miles-an-hour speeds. We must have the chassis to take such big engines and we must have tires that will be safe at such great speeds. But we are not going to back away from increased horsepower."

Tire companies already are working on their end of the problem. Dr. Arthur Bull of U. S. Rubber Co. told me they are experimenting with new tires which will take speeds of 100 miles an hour or more.

Doctor Bull mentioned Cadillac and Chrysler as two of three cars being used in his company's experiments. The Nash-Healey is another high-speed car.

Packard has started the trend toward power brakes for these superspeed cars. Graves pointed out that power brakes not only give more effective stopping but cut down the reaction time for putting on the brakes. The brake height is about the same level as the accelerator pedal, which brings the foot smoothly and without lifting from the gas to the brake.



Republic Aviation Corp. photos

Jet-Fuel Truck

Quick fueling of rocket-propelled interceptors is possible with a new "one stop" servicing truck. Because of the highly volatile fuel they use, rocket planes must be fueled just before take-off and previous methods have required many hours. The truck carries two large tanks, eight bottles of pressurizing nitrogen, an engine generator, a fire-extinguishing system, a compressor and a pump. One tank holds 900 gallons of liquid oxygen; the other holds 700 gallons of a water-alcohol mixture.



Gasoline-Flow Regulator Gives Better Auto Mileage

Gasoline flow to automobile carburetors is reduced and smoothed out by a new pressure regulator. In cross-country tests it has added as much as three miles of driving per gallon. Most fuel pumps deliver from two to six pounds' pressure and move gasoline to the carburetor in pulsations. The new regulator standardizes the pressure at 1½ pounds and creates an even flow, preventing too rich a fuel-air mixture. It virtually ends carburetor flooding and lessens wear on the needle valve and seat.

The World Will Be Watching . . .

. . . As presidential candidates are nominated in the July political conventions. For the first time in history, TV will go all out to bring our foremost political figures within handshaking distance of millions of American voters. How will it be done? In four pages of detailed cutaway drawings in June, we'll show what you'll see on your TV screen, what goes on behind the scenes and the vast facilities for televising the greatest political show on earth, come July. Don't miss it.

Atom-Powered Sub

The USS *Nautilus*, first U. S. atomic-powered submarine, will have a power plant based on an experimental model developed at the Atomic Energy Commission's test station near Arco, Idaho. Both the nuclear reactor and the associated propulsion equipment will be built by the Westinghouse Electric Corp., which also is building the turbine and gear assembly for the USS *Forrestal*.

The OWNERS REPORT



Floyd Clymer at the wheel of the Pontiac Chieftain which he drove 2792 miles. Top of horn ring interfered with his speedometer vision



THE POPULAR MECHANICS MOTOR SURVEY AS CONDUCTED BY FLOYD CLYMER

I am the owner of a 1952 Pontiac, 6-cyl. 8-cyl. : Hydra-Matic Standard
I have owned it approximately 2 1/2 months. Speedometer mileage is now 10461.
Having tried both kinds, I find that my Pontiac operates satisfactorily using:
regular gasoline premium (high test) gasoline
My average gasoline mileage is 14-16 m.p.g. for city driving, and
20 m.p.g. for country driving.

I CHANGE OIL every 1500 miles.
I change oil every _____ miles, but also ADD OIL every _____ miles.

Roadability and handling qualities are: Excellent Good Unsatisfactory
Maneuverability in traffic seems to be: Excellent Good Unsatisfactory
Acceleration is: Exceptional Very Good Average Poor
Curb and road clearance is: Satisfactory Too High Too Low
Here are my main reasons for purchasing a Pontiac: Holds to road good - Ease of driving - low upkeep - durability

Particular features I like are: New Dual-Range Hydra-Matic Drive New "Economy" rear axle Longer rear springs New chrome body moldings The advanced interior finish, upholstery, etc. The in-line, L-head engine

If you own a "Catalina" hard-top model, how would you compare it with similar body styles in other makes of cars?
Specifically, what do you dislike about your Pontiac? Emergency Brake Cable freeze
might like emergency brake in center of dash. Bottle in Hydra-matic
Compression is too high for premium gas.

Have you ever owned a Pontiac before? Yes No How many? one

Would you buy another Pontiac? Yes Possibly No
How do you rate your dealer service? Excellent Good Average Poor
How do you rate your Pontiac generally? Excellent Good Average Poor

GENERAL INFORMATION
What type of engine would you prefer in your next new car? In-line V-type
No. of cylinders: 6 8 Valves: Side Overhead
Would you like a passenger car with greater horsepower output? Yes No
Approximately how much horsepower would you prefer in your next new car? 160
What improvements would you like to see in your new car? V-8 engine - large brake pedal

Based on my present experience, I want my next car equipped with: Standard trans
Overdrive New Hydra-Matic Drive Other type automatic transmission
Dual Range

This questionnaire will be tabulated fairly, and your name will be held in strict confidence. Please mail promptly to:

FLOYD CLYMER
1268 SO. ALVARADO ST.
LOS ANGELES 6, CALIF

My Name: [Redacted]
Address: [Redacted]
City & State: Klamath Falls, Oregon
Occupation: Law Filer
(Use other side for additional remarks)

The Oregon owner who filled out this questionnaire is typical of many owners in that he wants more horsepower in his next car and a V-8 engine; however, he indicates he also likes the present in-line engine

on the '52 PONTIAC

The true test of an automobile begins when the owner takes the wheel. This is another report from owners of 1952 cars who answered questionnaires sent by Popular Mechanics to 1000 Pontiac owners from coast to coast



Pontiac '52 Chieftain four-door sedan has a 122-hp. "8" engine

By Floyd Clymer

OWNERS of 1952 Pontiacs in our survey revealed they had owned an average of 2.9 Pontiacs before they bought their present car. This is an optimistic note that was reflected throughout the tabulations.

Quite a few owners shared the opinion of a Paducah, Ky., steam fitter who wrote: "I find Pontiacs operate more economically and are longer-lasting than any car in their price range I've ever tried." Others, such as a Milwaukee, Wis., bakery owner, a Greensboro, N. C., farm-machinery sales-

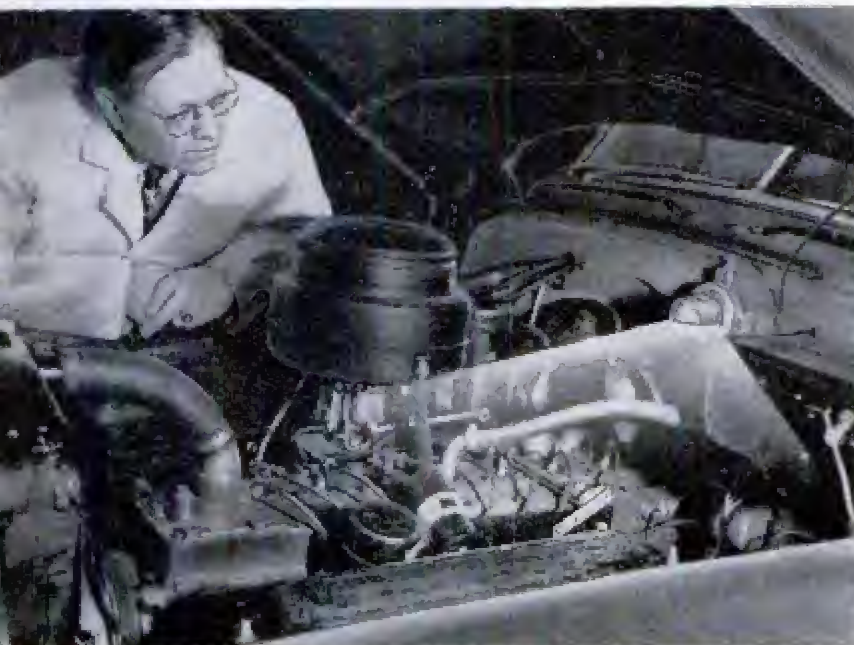
man and a Klamath Falls, Ore., saw filer, bought Pontiacs because they were impressed with excellent and courteous dealer service, which was rated "excellent" or "good" by 75 percent of all owners replying. To the question "Would you buy another Pontiac?" 70 percent said "yes."

Several traveling salesmen, such as one in Kentucky, wrote that Pontiacs are "extra tough and give fine service." Others, such as a Cottage Grove, Ore., physician, remarked that their local dealers gave the best trade-in value in the area.

A Salisbury, N. C., man wrote: "Most car manufacturers are ruining the front end of their cars. Some are broad and flat around the hood, some slope off so much they have the appearance of plowing into the ground with the radiator. But Pontiac lines are good."

These were the percentages for some of the direct questions we asked about the best-liked Pontiac features: New "Economy" rear axle, 51 percent; longer rear springs, 33 percent; chrome body moldings, 32 percent; interior upholstery and finish, 55 percent.

No one except a Racine, Wis.,



When hood is opened, the Pontiac Chieftain's engine is illuminated by handy light

Percentages from PM Poll

Owners of eight-cylinder models.....	96%
" " six-cylinder models	4%
Owners of Hydra-Matic models	75%
" " standard-transmission models	25%
Average gasoline mileage in country—	
six-cylinder models	20.2 m.p.g.
eight-cylinder models	17.0 m.p.g.
Average gasoline mileage in city—	
six-cylinder models	17.1 m.p.g.
eight-cylinder models	14.1 m.p.g.
Use premium gasoline	80%
Use regular gasoline	20%
Owners who change oil	100%
Average mileage for change of oil.....	1390
Owners who add oil (also change periodically)	5%
Average mileage for adding oil.....	1035
Maneuverability excellent	66%
average	33%
unsatisfactory	1%
Roadability excellent	73%
good	27%
unsatisfactory	0
Acceleration outstanding	29%
very good	57%
average	13%
poor	1%
Road clearance satisfactory	98%
too high	1%
too low	1%

Best-Liked Features

Dual-Range Hydra-Matic drive	69%
New "Economy" rear axle	51%
Longer rear springs	33%
Chrome body moldings	32%
Interior finish and upholstery	55%

Owners' Rating of Car

Excellent	53%
Good	38%
Average	7%

General Information

Prefer in-line engine.....	66%
" V-type engine	34%
" eight cylinders	95%
" six cylinders	5%
" side-valve location	51%
" overhead-valve arrangement	49%
" an increase in horsepower output.....	37%
Average horsepower output preferred....	130 hp.
<small>(Respective Pontiac horsepower figures were used for those owners who indicated satisfaction with present outputs)</small>	
Prefer an automatic transmission	78%
" standard transmission with overdrive.....	11%
" standard transmission only	11%
" Dual-Range Hydra-Matic drive	
exclusively	95%
<small>(The above figure means 95% of the 78% preferring automatic transmissions)</small>	
Prefer other type or make of automatic transmission	5%
Previous Pontiac owners	69%
Have owned five or more Pontiacs previously	12%
Will buy another Pontiac	70%
Might buy another Pontiac	28%
Will not buy another Pontiac	2%
Dealer service rated excellent	40%
good	35%
average	18%
poor	7%
Most frequent objections: 1. Body fitting and assembly; 2. Gas mileage; 3. Poor riding qualities or seating comfort; 4. Bad paint job, thin chrome; 5. Excessive engine detonation	
Improvements desired in next new car (in order of preference): 1. Better gasoline mileage; 2. New body styling; 3. One-piece windshield; 4. Better body fitting and workmanship; 5. Higher-quality paint and finish; 6. Better riding qualities or seating comfort; 7. More powerful engine; 8. Easier steering at low speeds, power-assisted or otherwise; 9. V-type engine; 10. Better visibility; 11. More genuine safety features; 12. Less brake-pedal pressure required	



Hand-brake lever is mounted on swivel bracket for ease of operation. Clymer liked red warning light

shovel operator said he bought a Pontiac because "they twisted my arm." But as usual there were some personal dislikes:

"Pontiac cars steer too hard."—Coquille, Ore., shovel operator.

"The car develops squeaks and rattles very soon. Better inspection of parts and assembly is needed."—Medicine Lodge, Kans., merchant.

"I took my car to five Pontiac dealers here and finally had to tune it myself. I sincerely believe they don't know their own product."—Detroit, Mich., maintenance superintendent.

"Not enough power in the six-cylinder

Clymer approves of tinted windshield glass during midday glare, but found it dimmed objects at dusk





On steep grades like this one, Clymer has high praise for Pontiac's new Dual-Range Hydra-Matic transmission

Hydra-Matic."—Nashville, Tenn., hospital supervisor.

"... Rides like a truck. Pontiac hasn't changed its body design for three years."—Chicago traveling salesman.

"Not enough room for passengers in rear seat of the Catalina model."—Gervais, Ore., building contractor.

"Tappet noise because of uneven pushers. . . . Rear window frosts when driving in cold weather."—Cloquet, Minn., construction worker.

A Detroit attorney wrote: "Nothing for me but Pontiacs. After owning 10 other makes, my last three Pontiacs convinced me Pontiacs top them."

A La Crosse, Wis., office manager, a Romulus, Mich., factory employee and a Detroit teacher were among several who said they want a one-piece windshield next time. A Hood River, Ore., physician suggested a radio speaker behind the rear seat and defrosters on the rear window. A Jersey City, N. J., electrician wants more

ash trays and a cigarette lighter in the rear.

A few owners, such as a Huntington, W. Va., Treasury agent and a Detroit truck driver, complained that the Fisher body has too many rattles.

The only objection a Birmingham, Ala., insurance man had was that "it is hard to keep the Hydra-Matic in high gear when moving slowly in traffic."

Here are some more owner comments taken at random:

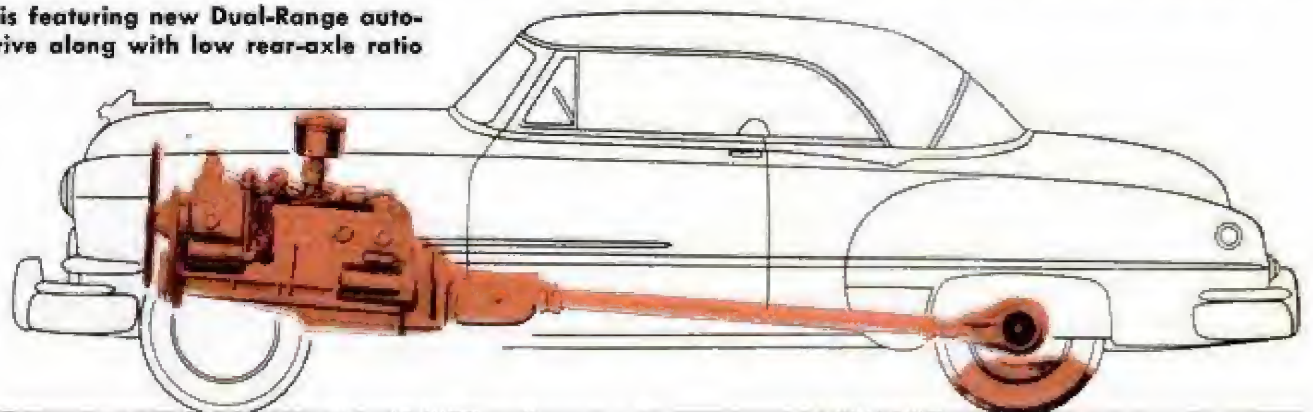
"The chrome body moldings are poor because they rust very easily. . . . I find I can drive a Pontiac all day with minimum fatigue."—Weirton, W. Va., millworker.

"Pontiac construction is much better than some others. . . . The brakes take too much pressure to stop."—Wauwatosa, Wis., construction engineer.

"Not enough soup for a 122-horsepower engine. I'd prefer 160 horsepower."—Seaside, Ore., truck driver.

My Own Road Test and Report: I tested a 1952 Pontiac Chieftain four-door sedan,

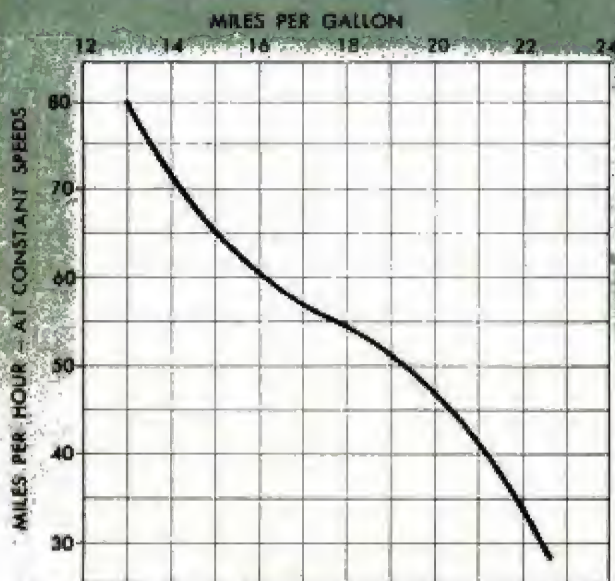
Pontiac is featuring new Dual-Range automatic drive along with low rear-axle ratio





CLYMER'S ECONOMY TEST

PONTIAC CHIEFTAIN EIGHT 4-DOOR SEDAN
WITH DUAL-RANGE HYDRA-MATIC DRIVE*



MILES PER GALLON

At Constant 30 m.p.h.	22.30
At Constant 50 m.p.h.	19.40
At Constant 60 m.p.h.	16.10
At Constant 75 m.p.h.	13.60

MILEAGE - CROSS-COUNTRY

Detroit to St. Louis (new car, snow, ice, cold, medium traffic)	14.70
St. Louis to Oklahoma City (cold, snow, ice and slush)	15.30
Oklahoma City to Los Angeles (mostly cold and dry)	17.20

(Premium gasoline of various brands was used)

*All automatic transmissions, regardless of make, secure from 1 to 4 m.p.g. less than the same model car with conventional or overdrive unit

After the test car was broken in, Clymer's mileage (Oklahoma City to L.A.) just about hit the average reported in survey. Below, Clymer uses a hose to prove his observations on the waterproof Pontiac



"The car is well-balanced," says Clymer, "and the stability (even with some 'roll' on the turns) is quite good." He credits this to excellent shock absorbers

which has a 122-horsepower straight-eight engine. The route was from Detroit to Los Angeles via St. Louis and Oklahoma City. The speedometer showed 2792 miles at the end of the run, which included some special road testing on side roads in the mountains and desert. Various weather conditions prevailed from zero weather, snow, slush, hail and rain in the Midwest to 80-degree temperatures in the desert.

The car is well-balanced and stability (even with some "roll" on the turns) is quite good. It handles well and there is a safe feeling while driving it. It had no tendency to hop around or get out of control on corners, at high speed or on wet roads and in normal driving there was little wheel spin on icy roads.

Over long, hard stretches the car had a maximum speed of 98 to 100 miles per hour by speedometer (as in other makes, I found a variation on the high side of about six percent). On a slight downgrade the speedometer showed a little over 100. The acceleration is extremely good and the car will cruise mile after mile easily at 75 to 85 miles per hour.

The Fisher body I found to be waterproof in many miles of driving through snow, slush and rain. No rattles or squeaks developed and the body had a feeling of solidity.

The vision is good, although the rear window on the model I drove could be enlarged. The hood is rather long and does not drop as much in front as I would like, or as much as other modern cars do, probably because of the long straight-eight engine used in the Chieftain (the six-cylinder engine fits under the same hood). The hood

(Continued to page 264)

Electric Wrist Watch

You never wind the mainspring of an amazing new wrist watch because it has none—it is powered by a tiny electric motor. No larger than a conventional wrist watch, the electric timepiece runs a year on a tiny battery which has less volume than a penny. The battery is designed so it can be replaced easily by a jeweler. Its power output is at such an even rate that the watch is said to keep better time than conventional watches using mainsprings. The subminiature electric motor (its coils are wound with 3000 turns of insulated copper wire only $\frac{1}{8}$ the thickness of a human hair) develops 1/75,000,000 horsepower. Not yet in production, the watch was developed by Elgin National Watch Company.

Right, a subminiature battery keeps the electric wrist watch running for a year



"Steam Bath" for Face

Shaped to fit the face, a new "steam bath" manufactured in Germany opens the skin pores for a beauty treatment or provides medicinal vapor for inhalation. Though the electrical appliance generates clouds of vapor, the rim which fits against the face becomes only lukewarm. There is a signal light to show when the current is on and a safety switch which automatically cuts off the current should the signal light be ignored for any length of time. Medication to treat asthma and other illnesses which impair the breathing can be inserted in the "facial bath."

Transistors Cut Size Of Army Radios 10 Times

Replacing many conventional vacuum tubes, transistors are making it possible for the Army Signal Corps to reduce one portion of its radio-teletypewriter equipment from 100 to 10 pounds. An additional advantage is that the new equipment can be operated on $1\frac{1}{2}$ watts from dry batteries instead of 175 watts from a generator. The transistors, which are germanium-crystal devices, have an estimated life of seven years of continuous use, many times longer than the ordinary vacuum tube.

Chrysler and General Motors engineers have jointly produced a set of pure-gold master blocks accurate to .000001 inch for precision measurement of surface roughness of machined parts.

The Cars They Drive Are Classics

Restoring and driving some of the greatest cars ever built — the "classics" — is the fast-growing sport of thousands of auto fans.

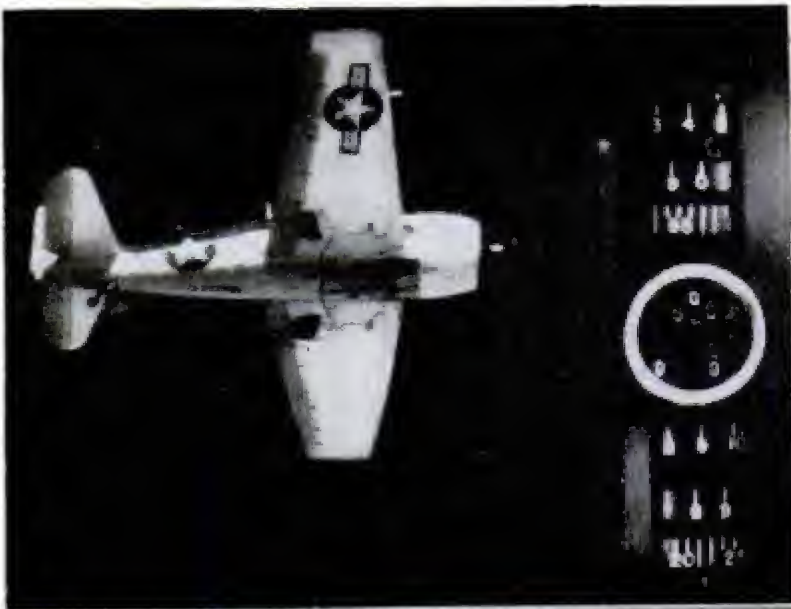
What cars are considered classics? In the classic hall of fame are the Marmon and Cadillac V-16s, the 12-cylinder Packards, some of the Auburns, Lincolns and Cords. The real king of the old-timers is the Duesenberg J, a juggernaut that has rolled into a legend.

A feature next month tells how to judge a classic and how fans go about restoring these special-interest cars to all their former glory. It's a must for auto fans.

Close-Up Photos From Miles Away

Left, airplane was three miles away when picture was made. Numbers on print show the azimuth and elevation of camera. In circle is reading of electronic stop watch

Below, missile-tracking camera is mounted on carriage of a 40-mm. anti-aircraft gun



Airplanes and missiles flying at top speeds several miles away are photographed close up by the Navy's new telescopic camera. Built on the principle of an astronomical telescope, the camera is a 10-inch reflecting telescope that exposes motion-picture film at a rate of 120 frames a

second. The photographer tracks the target with 25-power binoculars. Azimuth and elevation settings and time from an electronic stop watch are recorded on each frame of film for reference purposes. The whole camera assembly is mounted on a 40-mm. anti-aircraft-gun carriage.

Mystery Top

How does it work? A mysterious top, spun on a smooth surface in the ordinary manner, spins normally for a few seconds, then rolls over and continues to spin on its stem. Eventually, as it "runs down," the plastic top rolls over on its side and finally resumes its normally upright position. It comes in two-color combinations.



A
50th ANNIVERSARY
FEATURE



Rudard A. Jones, noted authority on the American home, weighs a gingerbread house of 1902 against a modern functional design. The author is an associate professor of architecture at the University of Illinois and has designed many homes

YOUR HOME—1902 to 1952

By Rudard A. Jones

University of Illinois Small Homes Council

TODAY'S HOUSE is changing — it is changing to meet today's living pattern. If we were to examine the very latest house in 1902, the year *Popular Mechanics* first appeared, and were to compare it with today's model home, we would be amazed at the difference in improved accommodations and livability.

Granddad's new house was probably two stories with a gable or a pitched roof. Its normal complement of rooms would include a living room, a dining room and a kitchen with adjacent pantry on the first floor. The upper floor provided sleeping rooms and bath equipped with plumbing fixtures that were fundamentally the same as the fixtures of our day. Granddad's house had a hand-fired furnace in the base-

ment but its performance left something to be desired.

The biggest surprise to us would be the lack of electricity and the equipment and arrangement of the kitchen. The kitchen was a large room furnished with a bulky range on one wall and a sink located across the room. This, of course, was the very latest house in 1902—it was certainly not the average home, which had yet to know the advantages of central heating and modern sanitation.

What caused the changes from 1902 to 1952? Today's living pattern is one factor. Our families are smaller; predominantly they are urban; many housewives work outside the home. We live informally today; the servantless family promotes this idea.





Small Homes Council, University of Illinois

This modern house is called "typical of the best in contemporary homes" by housing experts at the U. of I.

Our transportation is keyed around the automobile and the house is influenced by this.

The modern house sacrifices space for convenience. The Jones family would like to have more space in the house we are planning for ourselves but we will accept smaller room sizes in order to have adequate storage, automatic heating, an automatic washer and drier and perhaps a dishwasher and garbage grinder. As a matter of fact, our key requirement is some sort of a playroom or family room and to obtain this convenience we expect to have a smaller living room and small bedrooms.

Instead of human help, the American family depends on the many devices and

services now available. The large family with the hired girl and the handy man is almost gone. Food preservation by canning, smoking, drying and freezing primarily is a function of commercial organizations rather than the home now.

In one way our housing picture has remained static. In 1902, the principal characteristic of housing in the United States was the single-family dwelling. In 1952, the majority of families still want to own a home of their own and this goal is one of the major impulses in today's life. True, the home must compete with the automobile for its share of the family dollar and, also, some of the dollar that might have gone to the house itself in 1902 now goes





Picture windows give visual extension to living space, says author Jones. This one is in the PM ranch house

for television, radio and similar devices.

It is easy to see the effects of technological advance on our homes during the last 50 years. The expansion of public-utility systems, the widespread use of electricity, the development of new materials and new structural systems and the improvement of construction methods have each contributed to the modern house.

Electricity plays a key role in today's home. Electricity lights our way; it powers our clocks, radios, ranges, mixers, refrigerators, toasters, roasters, cleaners, washers, driers, ironers, freezers and even our razors; it summons us to the door; it enables us to communicate rapidly and surely; it controls our heating systems. In some communities,

electric power is even an energy source for heating. All this has happened since 1900.

Electricity has affected our house indirectly, too. The expansion of the aluminum industry is based on electric power; the electroplating industry obviously extends from the availability of electricity.

The nonchalance with which we regard this 20th-century phenomenon seems incredible if we stop to realize that the tungsten lamp did not appear until 1911, the household refrigerator until 1917 and fluorescent lighting until 1938.

Home heating is probably more in the public eye than any other particular house feature. The last 50 years have seen extensive investigations in the theory of human





A big favorite with today's home builder is the ranch-type house all on one floor level. The one shown above is the PM ranch house built by Tom Riley in Portland, Ore. The exterior was designed around the necessary living space needed to house the Riley family with best modern planning



comfort. Notable studies in this field have been made by the American Society of Heating and Ventilating Engineers and at the Pierce Laboratory of Hygiene, New Haven, Conn.

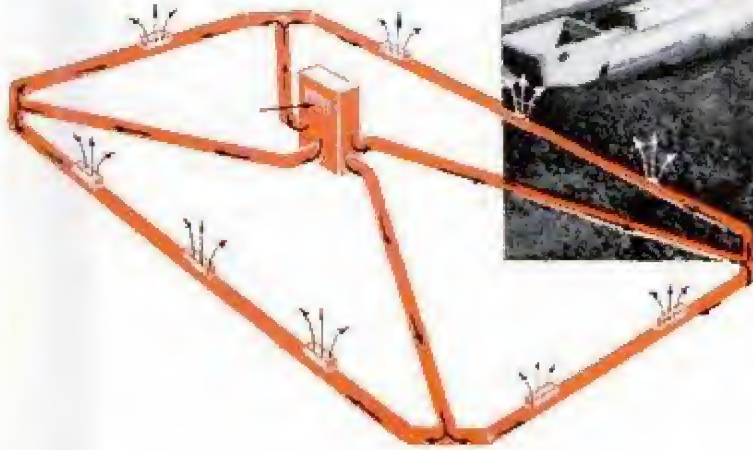
Home planning has always been influenced by the heating system and these systems have improved greatly in the past 50 years. At the turn of the century, interest in central heating first started to increase. Systems were usually the simplest warm-air, steam or hot-water types. A desire to improve warm-air-heat systems initiated the first Warm Air Heating Research Residence constructed at the University of Illinois in 1924.

The University of Illinois Engineering Experiment Station in 1939 arranged a similar type of investigation of hot-water and steam-heating systems. The idea of warm floors, walls and ceilings caught the fancy of many of us in the late 30s. Radiant heating (or panel heating, as engineers prefer to call it) had been used in Europe for some time in larger installations—it was slow in starting here. New homes began

Above left, kitchen for servantless home of today shows compact design and convenience. Just below is kitchen planned by G. E. with grill on terrace



One of the newest and best systems for heating houses built on a concrete slab is this perimeter, or "loop," system, according to author Jones. Ducts are embedded in floor with the perimeter registers beneath the windows. Heat passing through the ducts heats the floor by radiation. This plan saves fuel

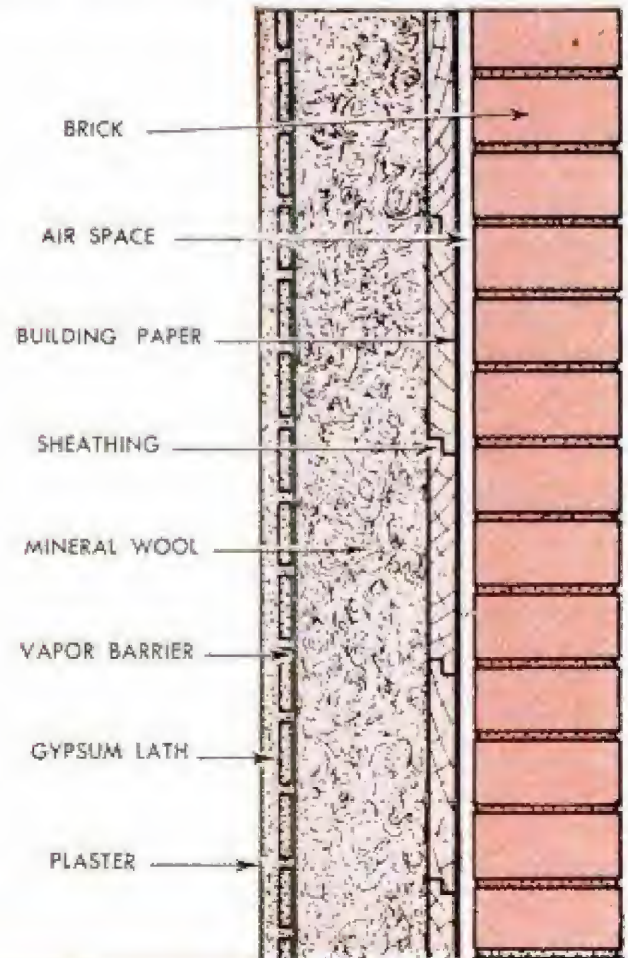


Courtesy National Warm Air Heating and Airconditioning Assoc. Below, insulation of houses is one of the great advances in housing during recent years. Cutaway below shows typical insulation of a brick house

appearing with concrete-slab floors that had pipe coils laid in the floor.

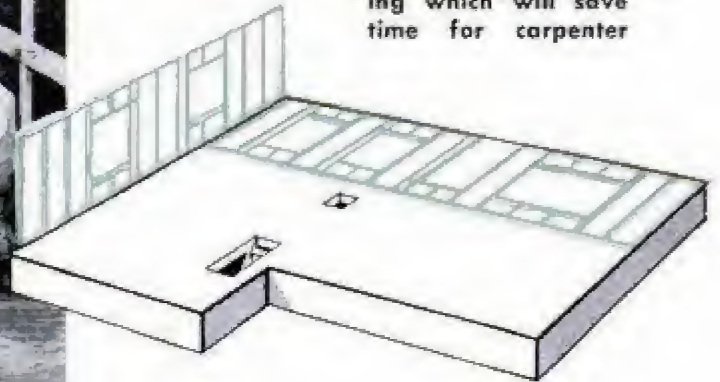
Later research and study showed that the heat losses of a concrete-floor slab were proportional to the edge length of the slab rather than to its area. Installation of edge insulation eliminated floor condensation troubles for houses without panel heating. A great increase in the number of houses built with concrete-slab floors instigated further investigations toward the heating of this type of house. Field studies showed that baseboard radiation was an excellent method.

Another outstanding new heating system is the warm-air perimeter system, used primarily for houses with concrete-slab floors. Perimeter heating involves the use of ducts below the floor slab, leading to warm-air-supply registers located around the perimeter of the house. Heat is supplied at the outer walls of the house where heat losses are greatest; the supply-duct location makes the floor warm. In the perimeter-loop system, a duct is looped around the entire house, warming the slab at the most





Among the improved construction methods is tip-up wall framing which will save time for carpenter



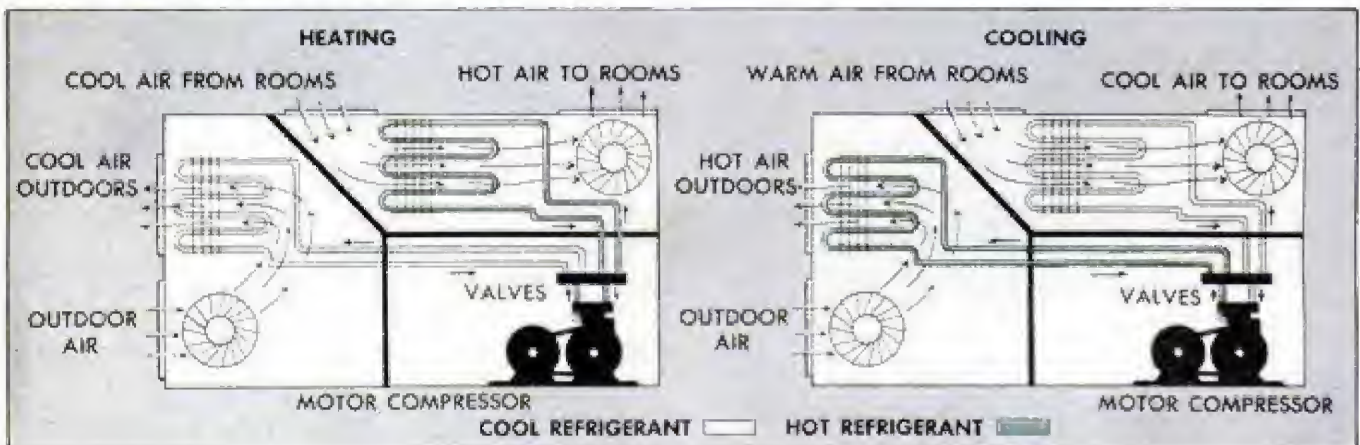
A far cry from old-time heating methods is the G. E. packaged heat pump that either heats or cools house

critical points. Radial supply ducts feed the loop duct.

When Dad read the first issue of *Popular Mechanics*, most homes were heated with coal or wood. In 1919, the domestic oil burner generally became accepted. As late as 1940, however, the census showed coal as the leader, with wood second and oil third. In the last 10 years there has been a remarkable change. The tremendous expansion of the natural-gas industry now puts natural gas in line as a chief competitor of solid fuel. In the postwar years, gaseous and liquid fuels have been the choice of most new-home builders.

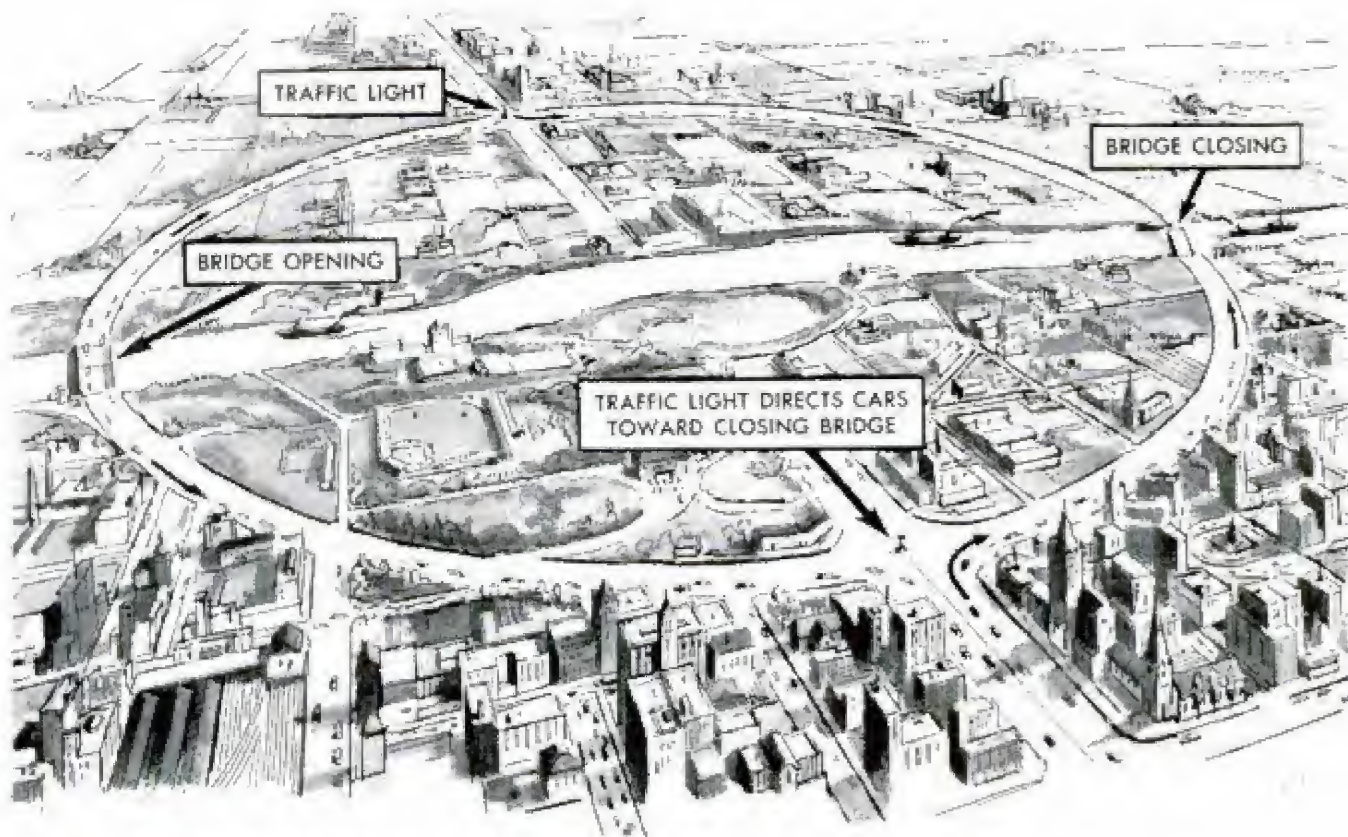
Recent years have seen much experimentation with the heat pump as a means for heating and cooling residences. This device offers the possibility of utilizing electricity

(Continued to page 258)



Below, there's 50 years of progress between old and new cookstoves, between parlor stove and gas furnace

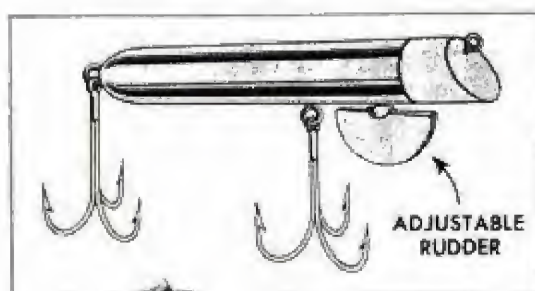




"Circular" Bridge Permits Continuous Traffic Flow

Traffic jams caused by drawbridges that open and interrupt flow along important streets and highways would be eliminated by a "circular" bridge. Actually, the bridge is simply a design to provide two choices for the flow of vehicular traffic. When one bridge is open, the other is closed and traffic flows without interruption. By the time the ship has reached the second bridge, the

first bridge has closed and traffic still flows continuously. The proposed bridge is about one mile in diameter and would be much cheaper to construct than a high-clearance bridge. The design was developed by Prof. Ralph G. Hudson of the Massachusetts Institute of Technology, who says that in some cases use could be made of existing streets and bridges.



"Torpedo" Lure Steers Itself

Fishermen can now cast with a lure that has an adjustable rudder which may be set to take a wide arc, right or left, on its return. Called a "guided torpedo," the plug is available in $\frac{3}{4}$ and $\frac{1}{4}$ -ounce weights for casting and in $\frac{1}{8}$ -ounce weight for spinning. The body of the plug has a finish of gold plate and its head is colorfully enameled in red and white.

Chemists now may use radioactive cellulose to learn exactly what wear, age, sunlight and other enemies do to clothes and many other products of everyday life.



See
Nov 1960,
p. 16

Hard to believe? You bet it is! But one Navy dive bomber did climb to 250 feet with wings folded before crashing in a spin

TALL TALES

From Korean Skies

By Arthur L. Schoeni

A NEW CROP of hair-raising tales has come to aviation since the jet age arrived. Swirling air battles over Korea with faster planes and new pilots provide "hangar flyers" with plenty of stories to recite when fog shrouds the carrier flight decks and landing strips. Freak escapes and mishaps, rivaling stories that came out of World War II, are almost daily occurrences.

The first American aircraft shot down in the Korean war was a helicopter. And it was destroyed by—of all things—a ground mine. The Air Force "pinwheel" was scouting along a road about 20 feet above the ground. Apparently, it flew over a land mine which was fired by some sort of proximity or acoustic fuse. The mine exploded, wrecking the helicopter.



Paratroopers making practice parachute leaps over Japan landed in the ocean when the wind changed while they were floating earthward. The men had no life jackets on, as they had expected to come down on land. A rescue helicopter hooked the chutes of four of the five men after they hit the water. Unable to pick up the fifth, the helicopter pilot used the downdraft from his rotor blades to keep the man's parachute inflated with air and literally blew him back to shore.

A Third Air Rescue Squadron's amphibian, piloted by Capt. Robert C. Mason, spotted an F-86 pilot ducking under water to avoid Communist bullets after he had crash-landed in a Korean river. Guided by radar, the rescue plane landed on the shallow river. It promptly got stuck in the mud flats. Attempts to launch a life raft and paddle to the fighter pilot were abandoned when enemy fire came too close. Lowering his plane's wheels, Mason plowed through the mud, picked up the pilot and got stuck again. He reversed the propeller pitch, opened the throttles and blew himself free, then took off down the river with all fingers crossed. The river was 6 feet deep and his plane drew 5½ feet of water.

Everybody knows an airplane has to have wings to fly. Navy fighters and dive bombers, because they operate from the cramped flight decks of aircraft carriers, have wings that fold upward or backward like a bird's. One Navy pilot tried to take off from the runway of an air station with the wings of his dive bomber folded upward. He not only tried to, he did! The powerful engine succeeded in getting the 20,000-pound plane 250 feet into the air before it went into a spin and crashed. The half wing extending from the fuselage to where the outer wing folded up apparently offered enough lifting surface to get the plane off the runway. Any aviator will still argue it can't be done.

Below, luckily damage was slight when an F4U's belly tank ignited as the plane came down on a carrier deck



Bullet entered cockpit, knocked off pilot's goggles, smashed piece out of canopy, but he was unscratched!


Helicopters have performed some fast rescues after pilots have gone into the ocean from carrier decks. Some hardly get their feet wet before the pinwheel lowers a sling to rescue them.

Oddest "save" in the books probably was made when a helicopter rescued Lt. (jg) K. R. Sutliff from his plane—while it still was on the deck of the carrier *Palau*.

Sutliff's plane caught an arresting wire but went over the side of the flattop, its hook still fouled on the wire. The only way the pilot could get out of the dangling torpedo bomber was for the rescue helicopter to come alongside and lower a sling to him.

Even with most of a wing flap knocked out by anti-aircraft fire, the pilot brought the plane in safely





A few seconds after his ditching, Sutliff was back on deck again.

A similar accident happened to Midshipman Frank E. Toy aboard the *Palau*. His plane went over the side, still hanging onto the tough arresting-gear wires. Upside down over the cold green ocean, Toy stayed in the cockpit until deck crews rigged a cable from the plane to the ship. He climbed to safety like a monkey on a rope.

Navy and Marine fighter pilots specialize in low-altitude strafing of enemy troops. As a result, they come home frequently with wings and fuselages riddled with anti-aircraft fire. One of the more eager pilots was Lt. Wayne R. Cheal, a Navy pilot off the

carrier *Valley Forge*. Strafing a truck convoy at "steering wheel level," he felt a jolt, apparently from a bullet hit. When he got back to his carrier, he found that a rock, not a bullet, had damaged his Panther jet. Some North Korean apparently had been a baseball pitcher before the war. The same thing happened to Lt. Clinton W. Effinger, who flew an F-80 home with a one-pound rock lodged in the wing.

The jet engines that drive today's fighters are pretty tough to knock out with gunfire, more so than the piston engines of propeller-driven craft. One centrifugal-flow jet was hit by a bullet while Marine Capt. George Keys was strafing at treetop level.



When this torpedo bomber went over the side of the carrier deck, its pilot clambered to safety on a knotted rope



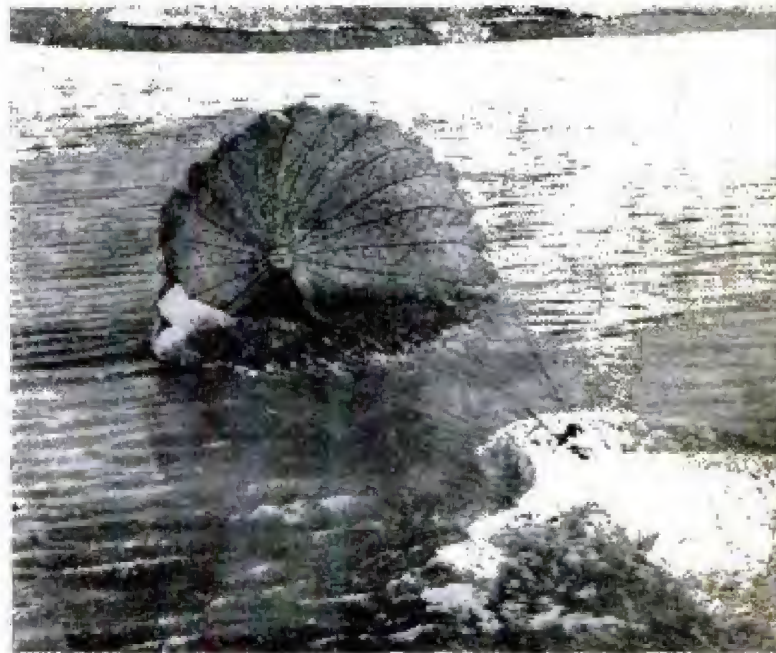
Incredible air rescue occurred when two pilots "carried" another plane on their wing tips after pilot lost consciousness

A bullet tore a 2½-inch hole in the combustion-chamber cover, passed through the engine and swirled several times around the turbine, revolving 12,000 times a minute. Curling the turbine blades to two thirds their normal area, the bullet was blown out the tail pipe. Captain Keys made several more bombing and strafing runs, then flew an hour and 20 minutes at normal cruising speed back to his base.

About the closest scrape with death racked up by an aviator probably was the experience of Flight Lt. Frederik Evert Potgieter, F-51 pilot in the South African Air Force. While he was on a strafing mission in Korea, a bullet from the ground penetrated his plane canopy, knocked the flying goggles from his face and left him unscratched. The combined force of bullet, goggles and impact bashed out a large hunk of canopy on the opposite side.

Landing a jet plane at 80 miles an hour on an aircraft carrier is ticklish business under normal conditions. That makes the

Below, paratrooper who landed in ocean during practice jump over Japan is blown to shore by powerful air blasts from rotor blades of a rescue helicopter



Below, by extending arrester hook of his carrier-based plane, one pilot cut Red communication lines





Above, its pilot almost completely blinded, the F9F is being "talked" down to land on the carrier deck. Left, the pilot is lifted from plane after landing

feat of Ensign E. D. Jackson even more fabulous. Blinded by blood, he was "talked" 120 miles back to the *Philippine Sea* by his wingman, Ensign Dayl E. Crow. When he arrived behind the carrier, the landing-signal officer talked him to a landing, giving

him instructions over the radio because the pilot could not see to fly his plane.

Jackson was injured when his low-flying jet, zipping along at 400 miles per hour over the Korean landscape, hit some wires. The impact smashed the canopy and bullet-proof glass and left Jackson unconscious for about 20 seconds. Somehow, his plane kept flying, going into a steep climb. Blood poured into his eyes, cutting his vision almost 100 percent.

By using his radio, Crow was able to tell

Arrester gear stops the jet as it lands on carrier but its nose breaks loose and heads for the water



the blinded pilot what to do to keep his plane flying level and when to lower his landing wheels. Jackson did not see the carrier deck until a flight surgeon leaped onto his plane after it had been stopped by an arresting wire and wiped the blood from his eyes.

An almost-unbelievable teamwork rescue saved the life of Capt. John L. Paladino, Thunderjet pilot in Korea. While flying over North Korea, his two teammates, Capt. Jack R. Miller and Lt. Wood McArthur, noticed him "flying all over the sky." The swift jet zigzagged crazily for a moment, nosed into a steep dive and then started climbing straight up.

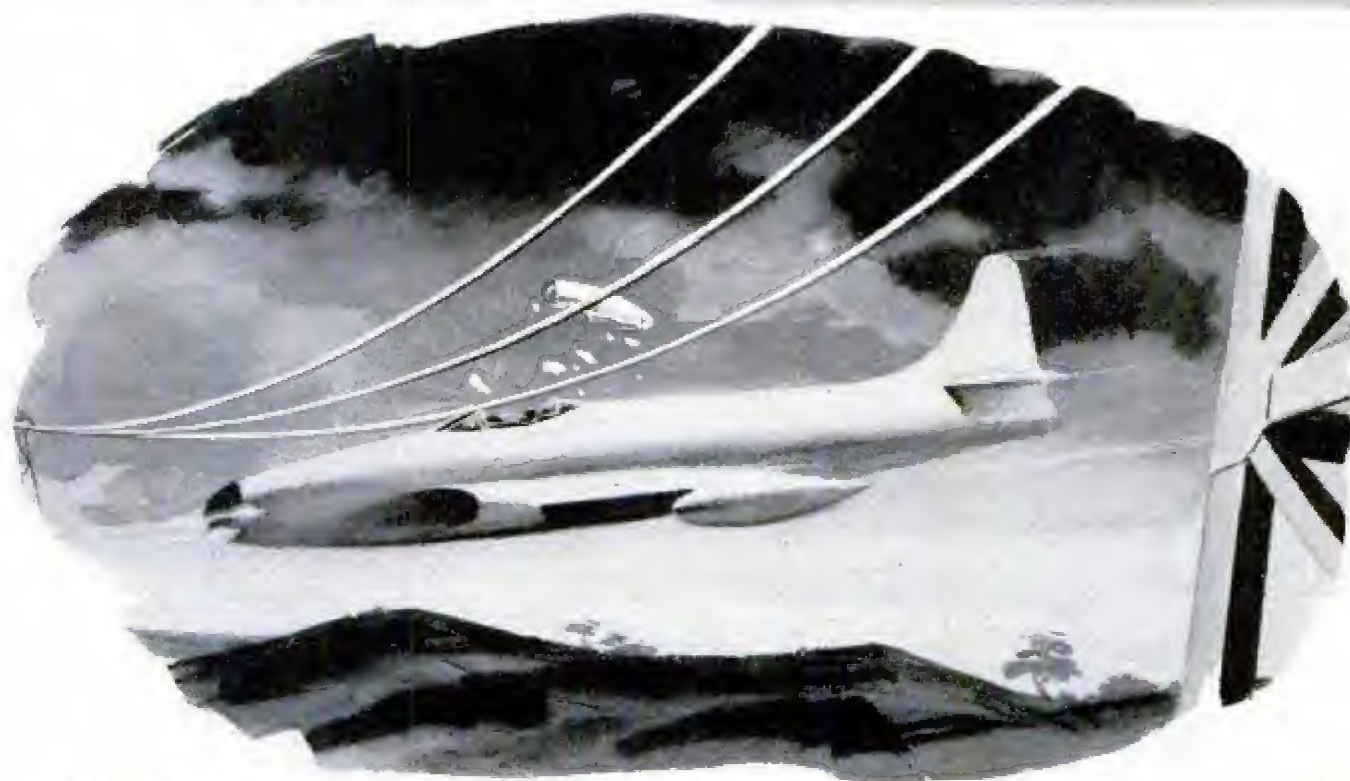
Believing Paladino's oxygen system was bad and he was suffering from lack of oxygen, the pair shouted over the radio for him to "snap out of it" and throttle back. He managed to do that, then passed out. Miller closed in and slid his wing tip under the left wing of Paladino's jet. Then he told McArthur to "pick up" the right wing tip. The two planes actually held the third plane up by its wing tips. There was no actual contact — the tips were kept apart slightly by fast-flowing air currents. In a few minutes they had steered the unpiloted jet back to friendly territory and eased it down to an altitude where Paladino could breathe. He revived quickly and reported afterward, "I had a death grip on the stick and a rotten headache. I sure was lucky to have my wingmates along."

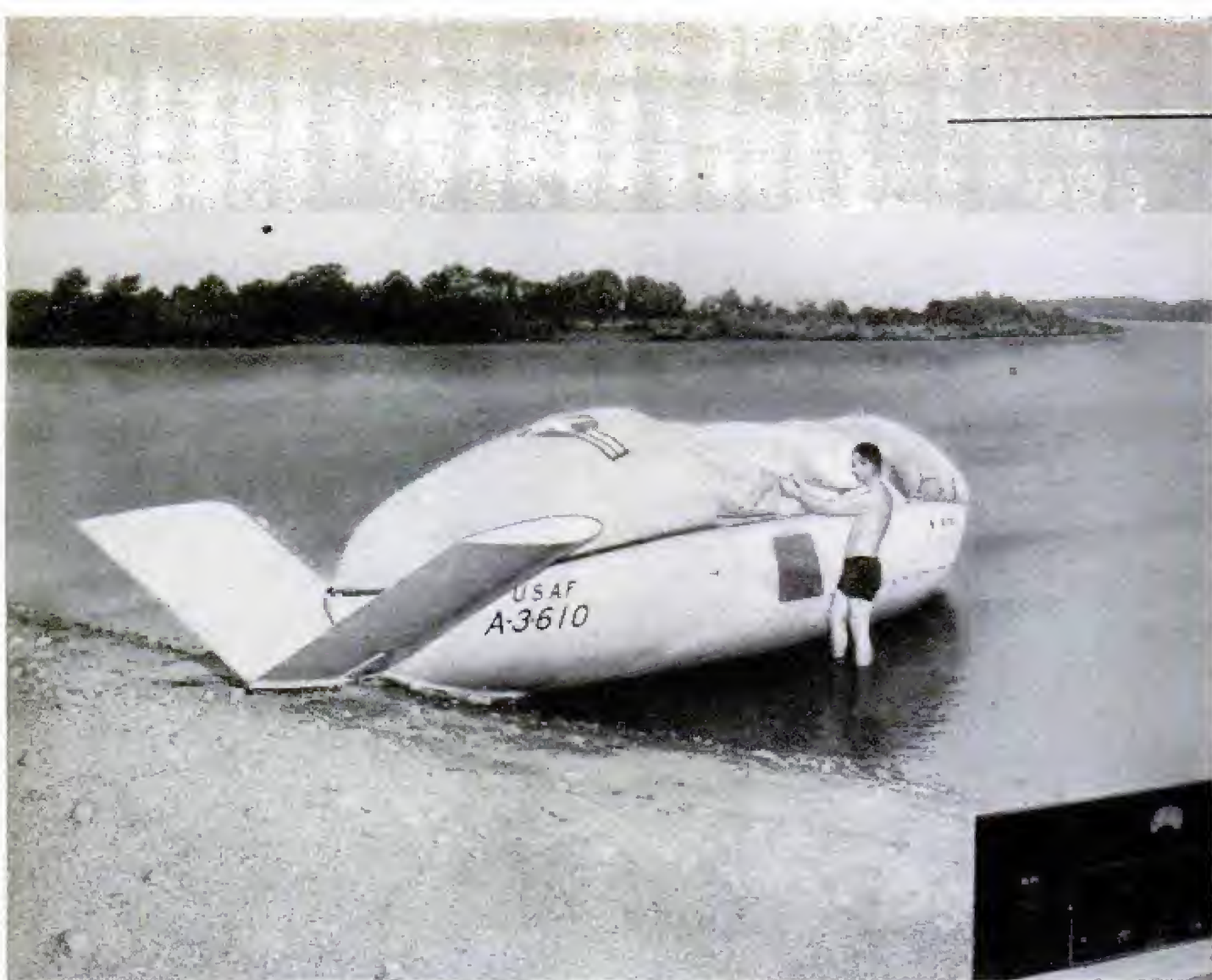
When the fighting was roughest in the frozen north of Korea, a couple of Marine pilots, Capt. Philip DeLong and Lt. Harold Daigh, spotted six loaded trucks about 50 feet offshore on a frozen lake near Wonsan.

(Continued to page 254)



Above, flak did this, but the Mustang returned home safely. Below, when the pilot came back to his base, he was minus a cockpit canopy. He lost it when he ran into power lines on strafing attack, bottom





Westinghouse photos

Radioman, far right, remotely pilots the 15-man lifeboat, above. Stern fin keeps the boat level as it falls from the rescue plane. Below, boat can be controlled with push buttons by survivors

Lifeboat Has

FAR OUT AT SEA an Air Force plane crashes. Search planes head over the area, and the survivors are spotted in the water. Then an amazing series of electronic miracles begins.

From the rescue plane drops a lifeboat shaped like a fat cigar. A stabilizing fin on the stern keeps it level until a parachute opens.

Once it is in the water, more amazing things happen. Parachute and fin are jettisoned. A guard that protects the rudder and propeller from crash damage is released. A sea anchor is dropped. Vents for the engine open and a blower starts clearing the engine compartment of dangerous fumes. The engine is cranked and choked. Soon it is purring. The clutch is engaged, the throttle advanced and the lifeboat is under way.

It heads toward the men in the water. The survivors climb aboard on a ladder that drops into the water. Then the lifeboat heads for shore or the nearest vessel.

Even though the survivors are too weak to





Above, engine is mounted below deck of the craft and can be entirely controlled by unit in hands of engineer. Or, if the passengers are too weak, the operation can be performed from plane by radio. Below, ladder drops into water for survivors

Invisible Crew

do any more than pull themselves aboard, the lifeboat will take them to safety. It is manned by an invisible crew of radio waves.

A radio operator in the rescue plane performs all the operations by remote control.

If the survivors are strong enough to run the boat, there are two systems they can use. One is a push-button control that starts, stops and steers the boat at the touch of a button. The second is a conventional manual-control system for use if the push-button system fails.

The 3500-pound craft carries 15 men, provisions for 10 days and fuel for an 800-mile cruise. Two-way radios provide boat-to-plane communications. There's a machine for distilling fresh water from sea water. A zippered canopy protects the passengers from sun or storms.





Rolled onto a gymnasium floor, the portable pit can be set up for either pole vaulting or high jumping



Welded-steel electrical conduit forms frame of the pit. The box into which the pole end fits is detached for high jumping



After the pit bottom is laid with loose wooden planks to give it a springboard effect, it is covered with a canvas tarpaulin

Portable Pit For Pole Vaulting

Quick change from outdoor to indoor use is possible with a portable pit for pole vaulting and high jumping. Designed and patented by Bob Hendershott, track and football coach at Klamath Falls High School in Oregon, the pit is made of welded-steel electrical conduit. The bottom of the pit is constructed of loose wooden planks for a springboard effect. A canvas tarpaulin covers the planking and a second tarp is tied over the entire framework. Wood shavings fill the pit to a depth of 16 to 24 inches. The unit is mounted on four airplane tail wheels and the box for the pole can be quickly disconnected when the pit is used for high jumping.

Sources of available products described in this issue are indexed on pages 12, 14 and 16. Sources of further information on other articles are listed in the WHERE-TO-FIND-IT LIST, which is available to readers without charge from Bureau of Information, *Popular Mechanics*, 200 E. Ontario St., Chicago 11, Ill.



Floor for a Pond

Carpenters at Natick, Mass., actually have built a floor for a pond! It's the novel answer to an old problem. None Such Pond has a mud bottom that has ruined swimming during the summer months. Sand dumped into the water gradually dis-

appeared. During the past winter, carpenters nailed together 16,000 board feet of spruce to build a floor atop the ice. Sand then was poured over the flooring and, with the first thaw, the floor and its blanket of sand sank to the bottom of the pond. It's hoped that the solid wooden floor will permanently cover the mud.



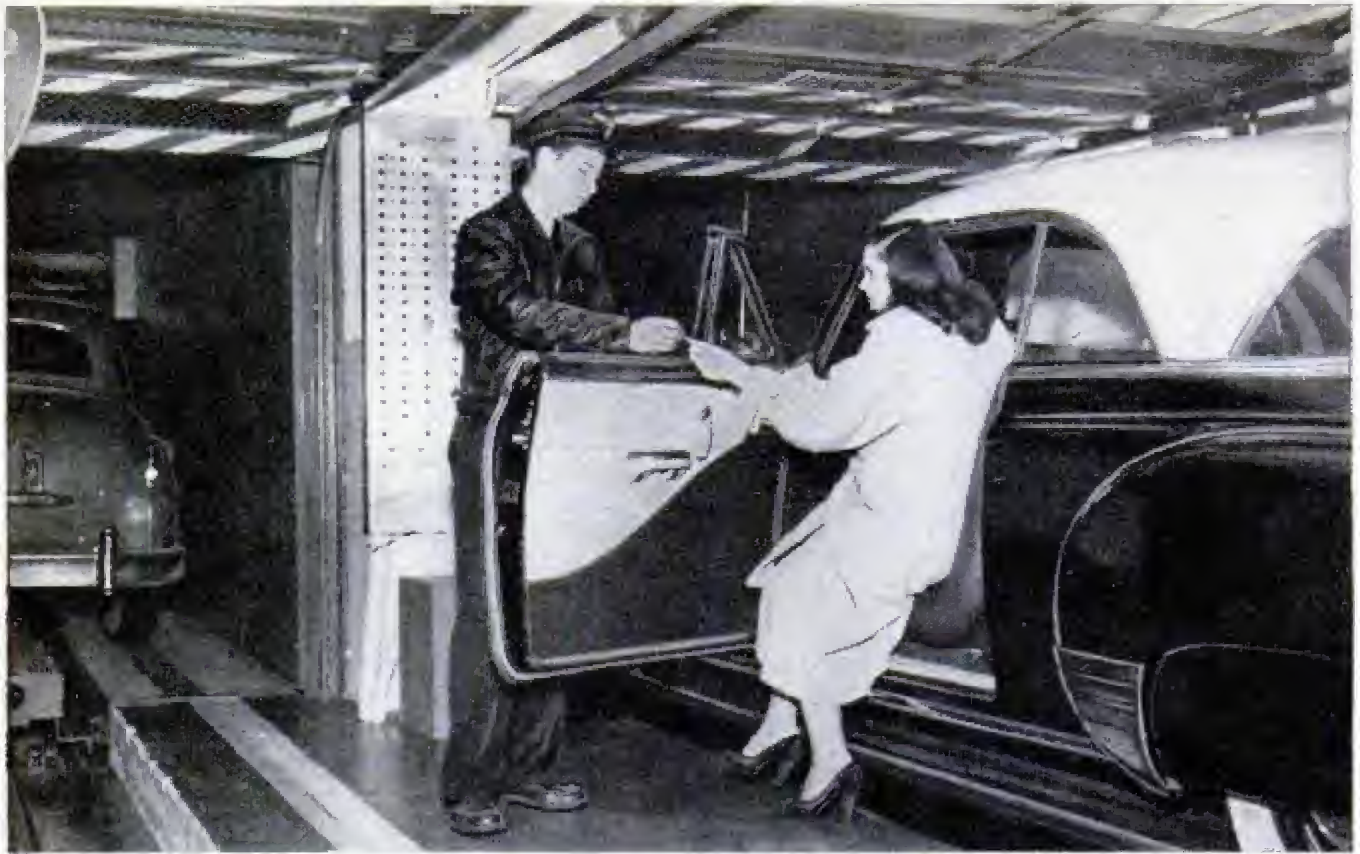
Heaviest Carrier Plane

Heaviest of the Navy's carrier planes, the new turboprop XA2J-1 is at Edwards Air Force Base, Calif., for further flight tests. It has a top speed of over 400 miles an hour and can carry a 10,000-pound bomb load. The craft's gross weight exceeds 26 tons. Neptune patrol bombers, about equal in weight, have flown off but never landed on carriers. The Savage's straight, 70-foot

wing has large high-lift flaps and a dual nose wheel that replaces a single wheel used on earlier versions.

Nylon Hypodermic Syringe

Virtually indestructible, a new hypodermic syringe is molded entirely of nylon. It is lighter in weight than the conventional glass type and will withstand sterilization by boiling, autoclaving or chemicals.



Customer at this parking garage merely rolls up to the entrance. Robots handle job of parking the car

PIGEONHOLE GARAGE

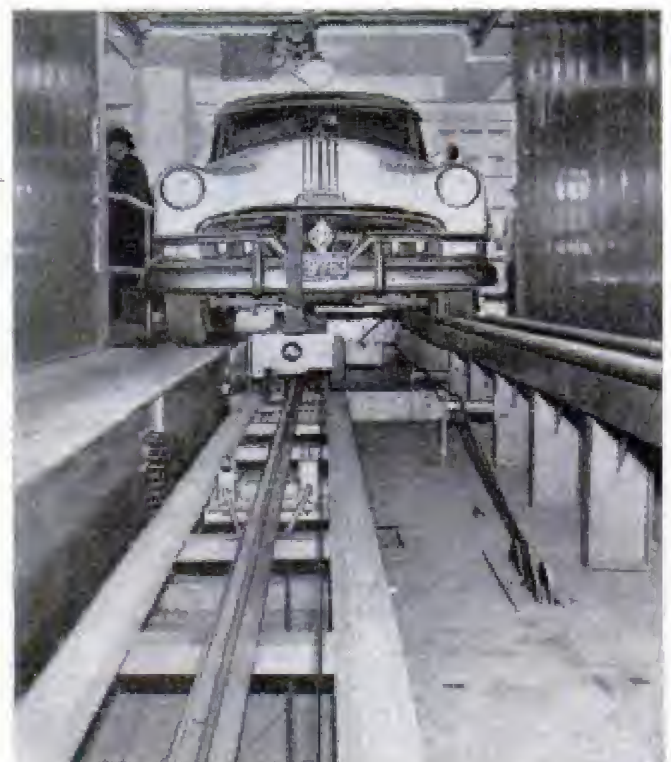
SOME TIME AGO a businessman named A. G. Dezendorf gazed at the Washington Monument while calculations tumbled through his mind. The monument, he knew, was 55½ feet square at the base and 555 feet high. Its lower 400 feet, Dezendorf calcu-

lated, contained enough space to park 648 automobiles.

The businessman knew that a conventional parking lot big enough to handle that many cars would cost a fortune, even if available. Why not a tall narrow building?

Attendant scans his 72-button panel to spot unoccupied stall, then presses button to start robot

Dolly on rubber tires rolls along angle-steel track. When it's in position, two arms clamp car's bumpers

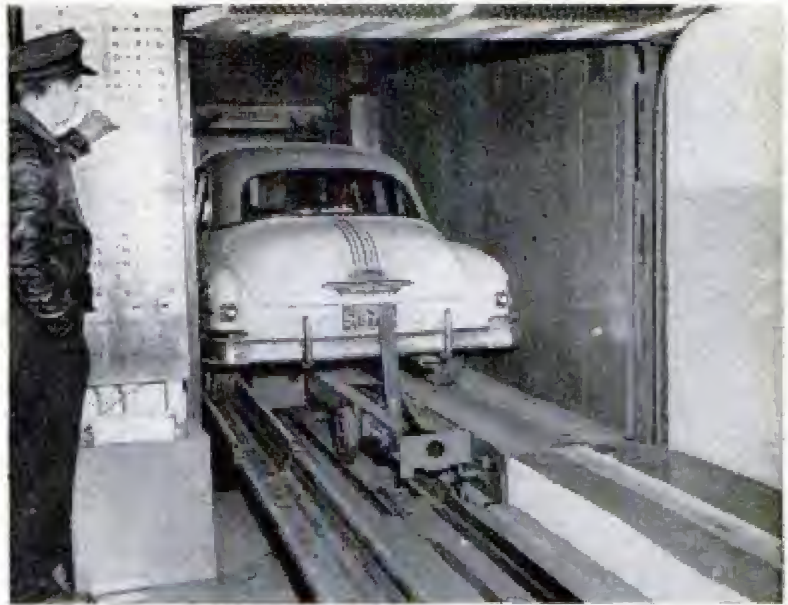


Today, on an area measuring only 25 by 72 feet, Dezendorf operates a fully automatic parking garage. In it, robots do all the work—not a hand touches the car as it travels to or from a stall on any of the 18 floors in the building.

The project requires but one attendant. Here's how it works: The customer leaves his car in an entrance lane. He may lock it if he wishes, as long as he doesn't set the hand brake. The attendant then presses a button which sends a 22-foot steel dolly on rubber tires under the automobile. The dolly moves along an angle-steel guide, propelled by a three-horsepower electric motor.

When the dolly is directly under the car, another motor swings two metal arms from a horizontal to a vertical position. From either end of the car these arms move toward each other until they press the car's bumpers.

Pressure against the bumpers starts the motor again, and the dolly rolls the car along the track and onto an elevator. The attendant, noting from green lights on a 72-button control board which stalls are unoccupied, presses a button to instruct the mechanism as to where the car is to be parked. The elevator moves up to the proper floor and the dolly rolls the car into the designated stall. The two clamping arms then drop to a horizontal position and the dolly moves off for its next load. The car remains in the stall because the floor slopes gradually away from the elevator.



Dolly moves off automatically, pushing the car into an elevator which moves up to the floor previously designated by attendant

The front wheels rest against a concrete barrier.

When the owner calls for his car, the attendant presses the proper button and the dolly rushes off to the desired car, whisks it down on the elevator and delivers it to the owner. The attendant can deliver any car in the building within one minute.

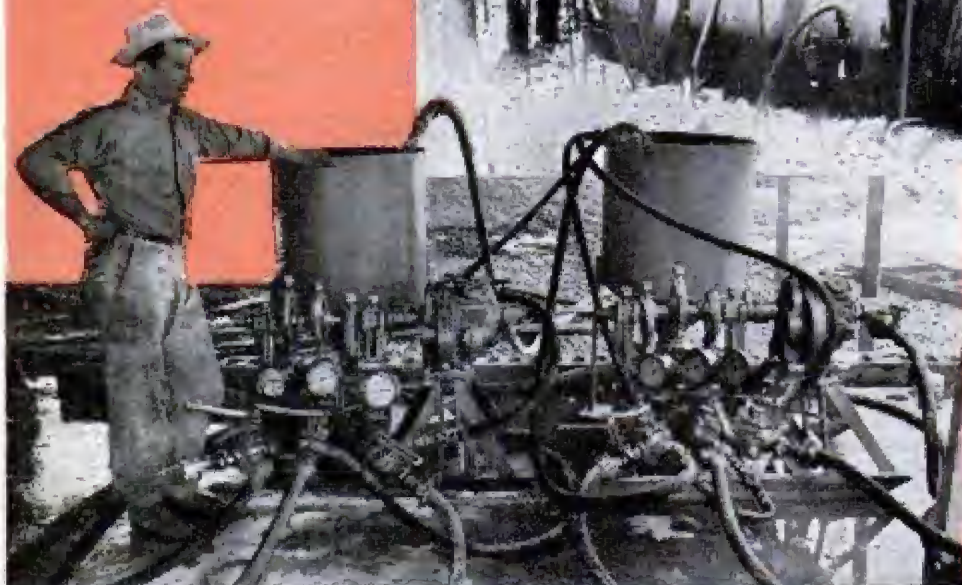
Should the attendant, at any time, push the button controlling an occupied stall, the mechanism cancels his instructions.

One side of each parking stall contains a trough-shaped runway for the car wheels, while the other is a broad slab of concrete. This allows for variations in widths of cars, thus permitting the garage to accommodate any size car from an Austin to a Cadillac.

At proper floor level, dolly pushes car into the correct stall, then on signal moves off for another load



What! ... No Concrete Mixer?



↑ Odd method of pouring concrete is used to cover installation of the powerhouse at the Bull Shoals Dam in Arkansas

← These pumps force grout or mortar through the bottom of the forms to flood installation, filling voids in rock



← Test core drilled from concrete poured by new method shows no weak, unfilled spots



CONSTRUCTION engineers have a new system for building big concrete structures. They simply dump rock and gravel into the forms, then pump a special mortar through the bottom of the mixture. The intrusion mortar is a combination of water, cement, fine sand and admixtures. It creeps into all voids between the rocks to form a dense concrete of high bond strength. The patented system recently was used to embed the scroll cases of the powerhouse at Bull Shoals Dam in Arkansas. It was faster and cheaper than usual methods.

Glass wall of experimental form shows how grout slowly moves upward from bottom

FEATHERED RACERS ON THE BEAM

By Shep Shepherd

TONY D'ANGELO is a good father but he couldn't stand being crowded out of his own home. "Son," he said to eight-year-old Jimmy D'Angelo, "something has got to be done." Jimmy looked around the back yard of the D'Angelo home in Culver City, Calif., at over 800 white rabbits and agreed that perhaps Dad was right. Something would have to be done.

After the last rabbit was traded or given away, Jimmy walked into the house with a pair of young squabs in his hands and, with an anxious eye on his father's face, announced that he guessed he'd raise a few pigeons. And that's how Tony and Jimmy D'Angelo got started in their favorite sport, pigeon racing.

That was back in 1937. From Jimmy's first pair of breeders, the D'Angelo loft has grown into well over 100 birds. In addition, they have given breeders to young Johnny Perkins, a neighborhood youngster, who has increased his flock to 45 birds and is also an enthusiastic racer.

Pigeon raising requires little time and space. Feeding is simple. Their diet consists of just about what you would feed chickens. Peas, grain and corn. The corn is fed in the whole grain, uncracked.

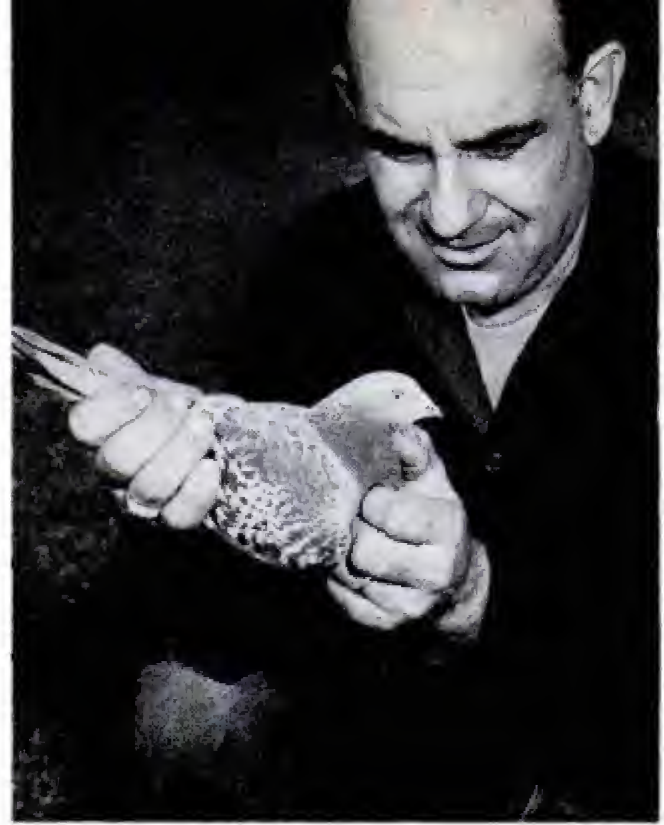


Three pigeons come in for a landing. In a competition, this is the most exciting moment. Above right, for taking off, the pigeon uses a tremendous downward thrust





Banded with code numbers by club officials, racing birds travel to the starting point in sealed crates

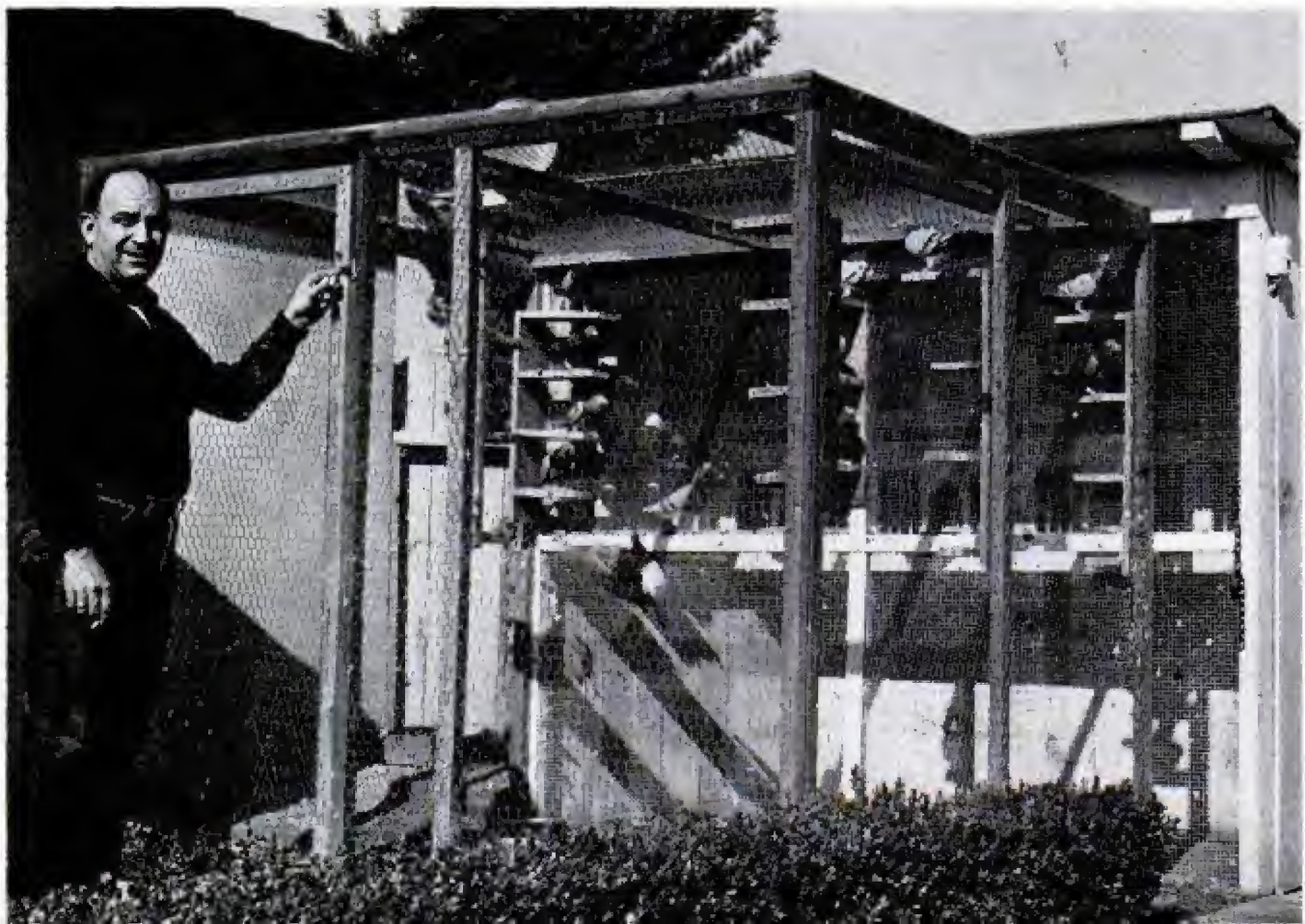


Susie is Tony D'Angelo's fastest bird — and, for that reason, is his favorite. In seven races, she's won six

Pigeons mate for life. The young cock selects a mate when he is about four months old. Though he keeps her for life, he doesn't always remain faithful. He'll take any female that happens along at the psychological moment. The hen lays her first eggs 10 days after mating and hatches the young in 18 more days. In exactly three weeks after the young appear, she mates again.

During the hatching and feeding of the young, the cock becomes thoroughly hen-pecked. He dutifully relieves mamma a couple of hours every day, sitting on the eggs while she gets out for a little exercise, usually from one to three o'clock in the afternoon. When the squabs are born, he even assists in feeding them. Members of the pigeon family, and this includes both

Raising pigeons doesn't require much space. As many as 100 birds can be housed in a 10 by 15-foot coop



male and female, regurgitate predigested food from their crops, which the babies obtain by thrusting their beaks down mamma's or papa's gullet. Pigeon fanciers call this food "pigeon milk."

The D'Angelos start training their young birds almost as soon as they solo. Early training consists of taking the pigeons a few miles away from home and releasing them. Tony starts with a seven-mile flight. Many trainers begin with two-mile flights but one California fancier makes his first release at 40 miles, his theory being that while he doesn't get all birds back, he gets the good ones.

Breeding usually starts in late January or February. Tony and Jimmy like to have either eggs or babies in the nest by the time the old-bird races start in April. The home ties are stronger at that time and such mental condition is important in a racer. Jealous birds are consistent winners when their mates are left at home, their suspicions forcing them to waste no time on the way home to investigate!

The old-bird races, which continue from



Each owner gets a sealed clock before the race. When his bird returns, he removes band from its leg, drops it in clock which registers the time

April through June, comprise ten races starting at 100 miles and increasing in distance until the final race of 600 miles from Klamath Falls, Ore., to the lofts in Los Angeles. This is for the clubs in southern California. Other combines have releasing points of comparable distances.

The D'Angelos belong to the Santa Monica club which is made up of 21 lofts

Pigeons take off on a practice flight. When released, they climb quickly in tight circles and head for home



operating with several other clubs to form a combine. These combines, or concourses as they are sometimes called, extend across the 48 states. From this entire setup one bird each year is selected for the Hall of Fame, which is the "Oscar" of pigeondom. Among the birds so honored was Cher Ami, the English pigeon that saved the famed "Lost Battalion" of World War I. Cut off by the enemy, the battalion had no means of communication except its pigeons. Food was gone and ammunition was fast running out. Two birds had been shot down trying to carry a request for help to the rear. Cher Ami, the last bird in the battalion, finally made it with one leg and part of his breast shot away.

Another honored bird was President Wilson, who performed a feat similar to that of Cher Ami only a few days before the armistice in 1918. He, too, made his way to his loft despite serious wounds, and his message brought relief troops to a surrounded unit.

Occupying a place of honor in the Post Library at Fort Monmouth, N. J., is the body of Mocker, a red cock attached to the 77th Division during World War I. He carried a message back to the supporting artillery which brought counterbattery fire upon German guns that were holding up the division's advance. Wounded twice by shrapnel in the flight, the bird recovered and lived to the ripe old age of 20.

Pigeon races, though covering hundreds of miles, are reduced to yards per minute. The day before a race each trainer selects the birds he wishes to enter. He takes them to his home club where they are banded with code numbers unknown to him. They are then placed in sealed crates and shipped to the starting point for release the following morning. At a given time all the birds are released simultaneously under the supervision of members of the combine to which the competing clubs belong. The birds rise in tight circles, the age-old instinct takes over and they streak away in the most direct line for the home loft hundreds of miles distant.

As the estimated arrival time draws near, the owners perch on ladders, fences or roof tops, scanning the skies for the first sight of a homing bird. Even fractions of seconds are important. When the bird lands, the owner must remove the rubber band from its leg, place the

**Left, shelves make fine daytime roosts.
Below, male takes a turn sitting on eggs**



band in a metal capsule, drop it into a special clock and turn a handle. Then, and not until then, is the time recorded. Tony D'Angelo calls this the most exciting and often the most heartbreaking few minutes a fancier can live through. With prizes ranging up to \$1000, and pool money aggregating again as much, $\frac{1}{10}$ second can mean the difference between prize money or just another runner-up. The timing clocks register the time in fractions of seconds which, when the yards per minute are computed, makes it possible for as little as $\frac{1}{100}$ yard to separate a winner from a loser. With hundreds of dollars in prizes involved, some anxiety on the part of the owner can be understood when a bird decides to land on a roof or a wire for a short rest before entering the trap.

Tony was the victim of bad luck on one such occasion. Watching the skies from a stepladder, he caught sight of his first bird coming in fast and low over the house tops. Hurrying off the ladder, he missed a step and fell to the ground with the ladder on top of him. The bird, a well-trained racer, hit the landing board and waited for him at the trap. It took no more than 10 seconds for Tony to unscramble himself and reach the bird but the delay cost him \$400. Another owner, in a spasm of excitement, winged his bird with a shotgun, but such practice is frowned upon.

The West Coast speed record for pigeons is 1763 yards per minute. This figures out to almost exactly 60 miles per hour. Eastern or Central birds can beat this time. The California course is reputed to be the toughest in existence. The birds must rise

8000 feet to cross the mountains, where they may encounter snow and extreme cold. Updrafts and downdrafts buffet them coming out of the mountains, after which they hit desert heat and sand storms. If they can get by hawks, falcons and trigger-happy hunters, they stand a fair chance of getting home, provided they don't decapitate themselves on a wire while flying low.

Racing pigeons can fly a 600-mile course from dawn to dusk under favorable climatic conditions, but there are times when they won't get home for two or three days. Rain and sand storms will put them down. They won't fly at night and many birds have been lost because they went down at dusk to roost in trees or barns where they became prey to cats and night-flying hawks. A romantic cock will sometimes follow a hen to a loft not his own. He won't stay there, but he possibly will dally long enough to lose the race.

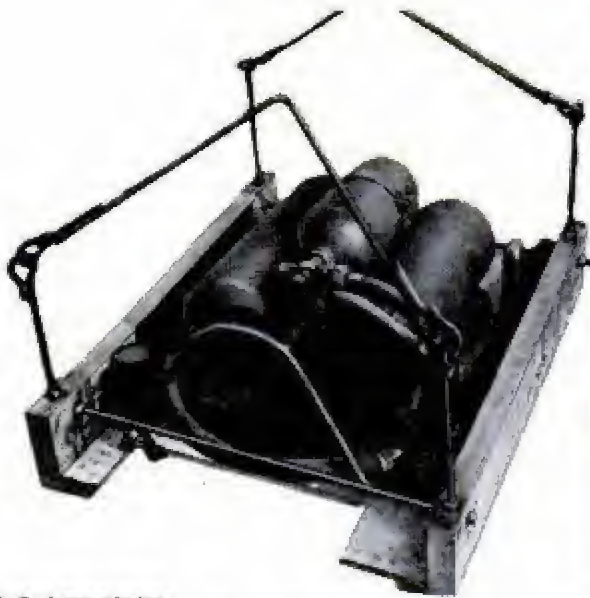
The period from the last old-bird race in June to the beginning of the young-bird races in September is given over to training the young birds. Young-bird races carry through to November. Four hundred miles is tops for the youngsters. An old bird is any bird hatched during or prior to the previous calendar year.

When the squabs are between 8 and 12 days old, they are banded with their permanent number. This is the number under which they are registered with the American Racing Pigeon Union and it is theirs for life. Pigeons reach their peak at two years of age though many fanciers fly birds eight or nine years. Tony retires his racers after

(Continued to page 236)

Pigeon housing is simple. Some boards nailed to the wall to form a bank of open squares are all they need





U. S. Army photos

Completely assembled, the flame-throwing unit and airlift platform weigh about 200 pounds

Rigging the units to L-19s for air drops takes a load off mountain-bound foot troops, who still have plenty to carry

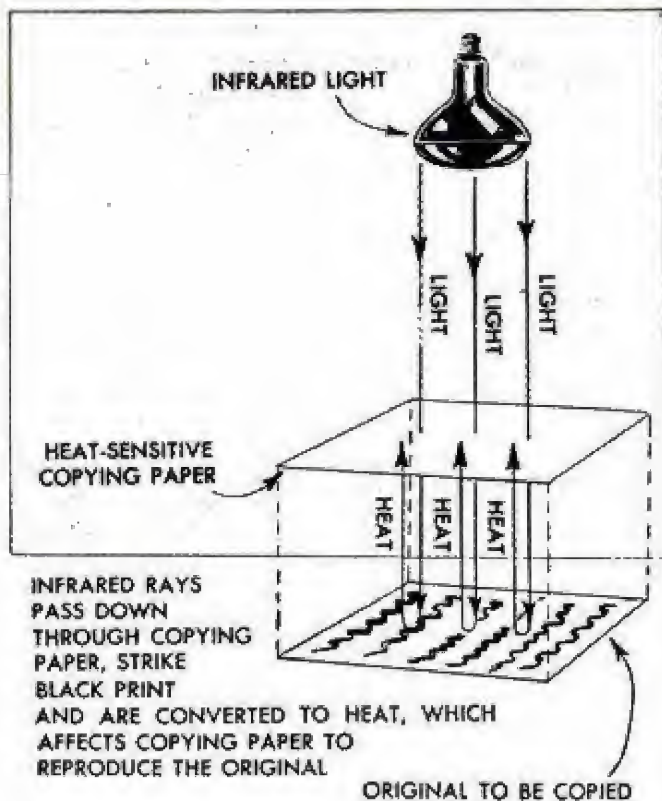
FLOATING FLAME THROWERS

Delivered to a front-line sector at the ground commander's request, an airborne flame thrower parachutes to the earth

IMPROVISED IN COMBAT, flame-throwing units dropped from the air were quickly effective in driving Communists from underground bunkers, caves and connecting tunnels in Korea. Maj. Clair L. George of the Second Infantry Division designed the airlift attachment when it proved impossible for foot soldiers to pack the heavy, bulky weapon into rugged mountain passes and retreats. An additional advantage of the airborne flame throwers is that they can be brought to bear against the target more quickly. The thrower is latched to a strong wooden platform by iron rods, and attached beneath the wing of an Army L-19 liaison plane. A control lever allows the pilot to drop the unit, weighing 200 pounds with its platform, and simultaneously open a parachute attached to it. Drops can be made with pin-point accuracy into otherwise inaccessible areas at altitudes of 100 to 200 feet. The minimum altitude for a drop is 50 feet.

Immediately after its delivery, the flame thrower is put into action by GI in Korea against a Communist underground bunker





Infrared Light Provides Heat to Copy Typewritten Pages

Four pages of solid typing can be copied in less than two minutes by a new office machine. The machine, which requires no darkroom, solutions, or negatives, uses infrared rays as the copying medium. The page to be copied is placed in the machine along with a single sheet of special paper. With the cover closed, a button is pushed

and in about 10 seconds the copy is produced. Inside the machine, the white space on the original sheet reflects the light, while the typed material absorbs the light and converts it into heat. This heat is transferred to the heat-sensitive paper in order to reproduce the original page. More than 120 sheets per hour can be copied.

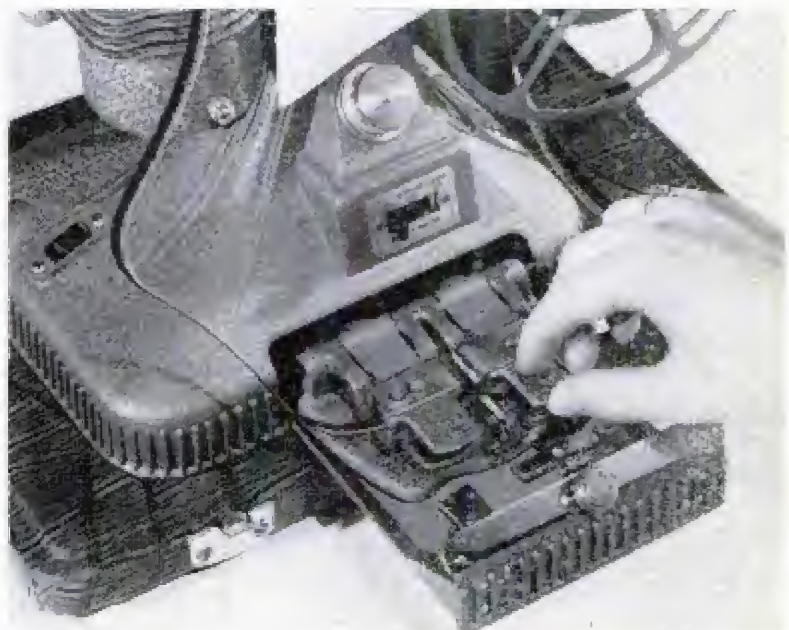
Plastic Disk With Adhesive on Both Sides Takes Place of Thumbtack

Now you can stick posters, photographs, advertisements and other notices to any surface, including glass, with a plastic disk. Unlike thumbtacks, the disks do not pierce the paper or the surface to which they are

applied. With adhesive on both sides, the disks adhere to metal, wood, paper and glass when you apply gentle pressure. The manufacturer claims the plastic disks may be used repeatedly.

Projector Has Splicer Built Into Base

Built into a drawer in the base of a new projector is a complete splicing outfit so you can repair breaks in film without removing film or reels. The splicer also can be used for editing, title insertion and reel connecting. A hand threader and safety-glass heat filter permit you to examine film, frame by frame, during editing. A master switch on the projector turns on the room light when the projector is turned off.



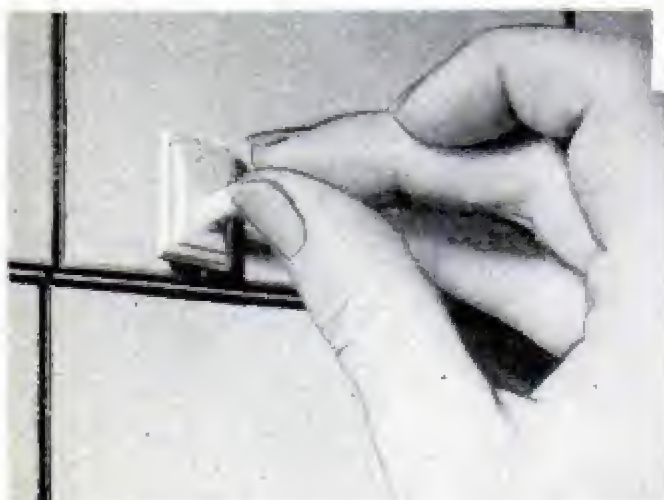
Twenty million motor trucks and busses have been built in the U. S. since 1904.

WHAT'S NEW FOR Your Home



↑ **MOISTURE INDICATOR** tells the lady of the house when to water her plants. Normally pink stripes on indicator turn blue when soil is dry

← **PLASTIC TRELLIS** gives colorful support to flowerpots and table centerpieces. It stands eight inches high and has a spread of five inches



1. **KIDDIE KEEPER** is a portable crib and bathtub for first few months of baby's life. Sides, inflated by mouth, keep child from rolling. Deflated crib folds up into a small package

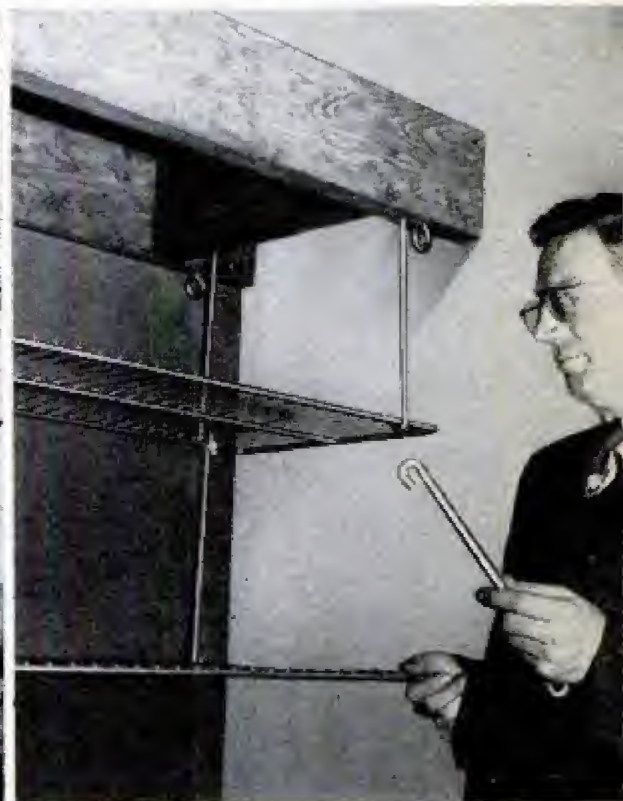


2. **IRONING PAD** has an aluminum-foil center which bounces back the heat to iron underside of garment while top side is being ironed. Perforations in foil permit passage of the steam so the pad stays dry. Full-size pad, not shown, fits standard-size ironing boards

3. **POT HOOKS** (shown in photos), towel racks and other wall fixtures are stuck to plaster and tile walls without screws. Tiny capsule of special adhesive is packaged with each fixture. It's punched with a pin and adhesive spread on back of hook or hanger. Fixture is ready for use in 24 hours



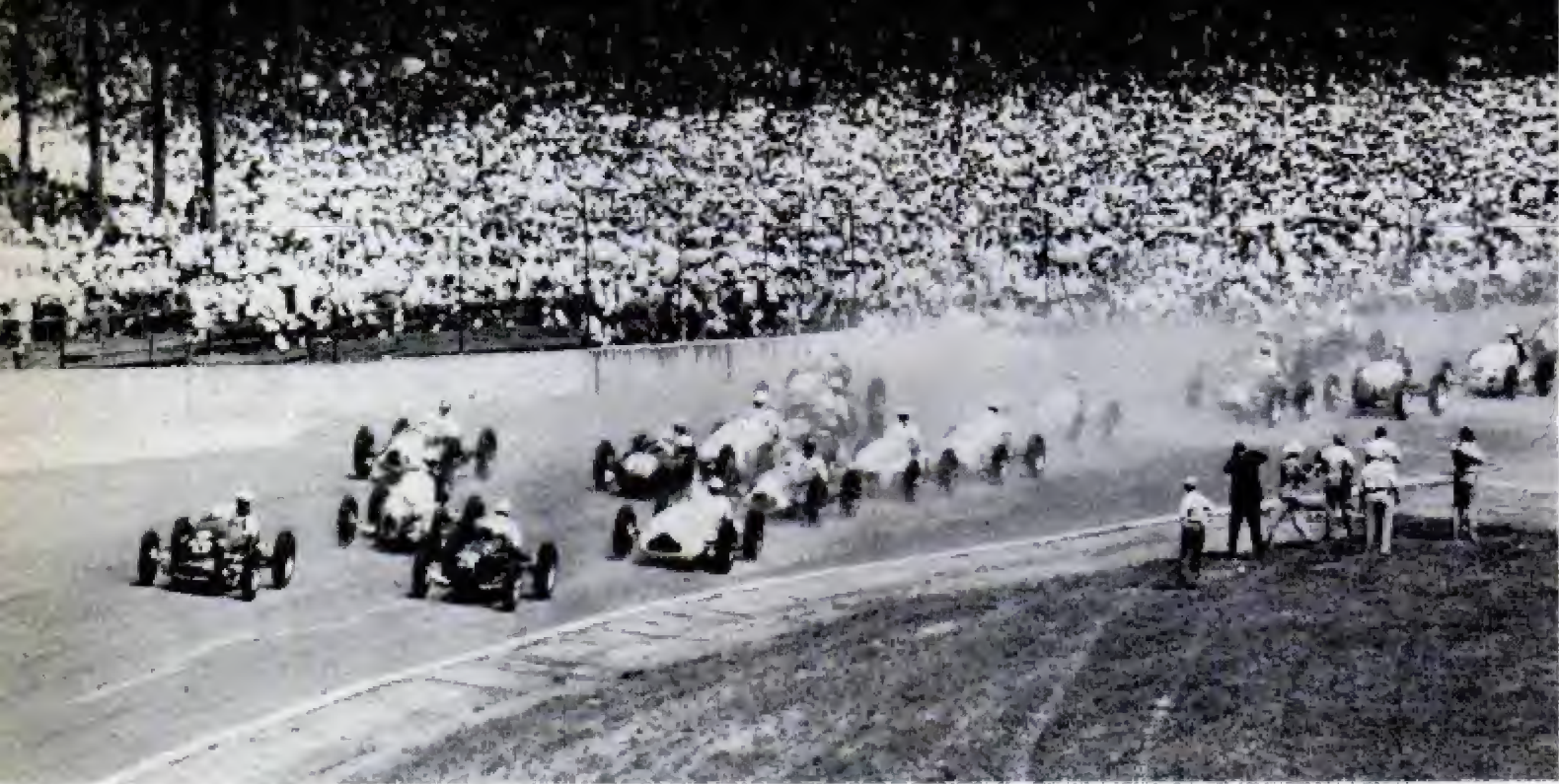
4. **FAN-DEHUMIDIFIER** fits into standard windows, has twin air directors that swivel in complete circle. Unit filters the air and takes out water at a rate of more than one quart an hour. Special mounting platform requires no screws. The unit projects only 9½ inches into room



5. **WIRE SHELVES**, when fastened overhead with four hooks or spikes, support each other. Shelves are 14 inches deep and 36 inches wide, can be hung from ceiling to floor if desired



6. **VALANCE** has built-in fluorescent tubes which cast soft light over windows or walls. Valance lights are available in five widths from 24 to 108 inches. Various units can be combined for different widths



At Indianapolis you will see race cars sporting tipped-over engines and magnesium wheels. Drivers say the champ will pilot a light car and . . .

HE'LL WIN THE SPEEDWAY ON

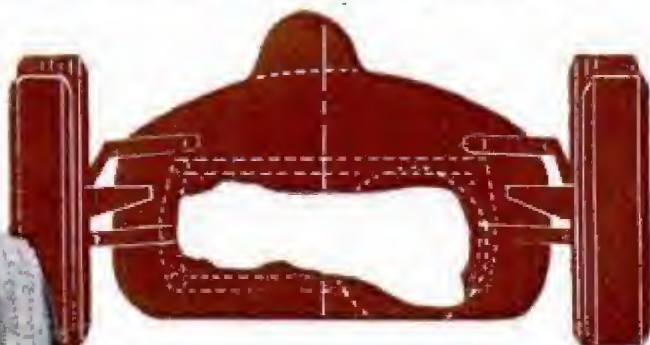
By Thomas E. Stimson, Jr.

TWO MILLION DOLLARS worth of race cars will be competing late this month for places in the starting line-up of the annual 500-mile Memorial Day race at Indianapolis Speedway.

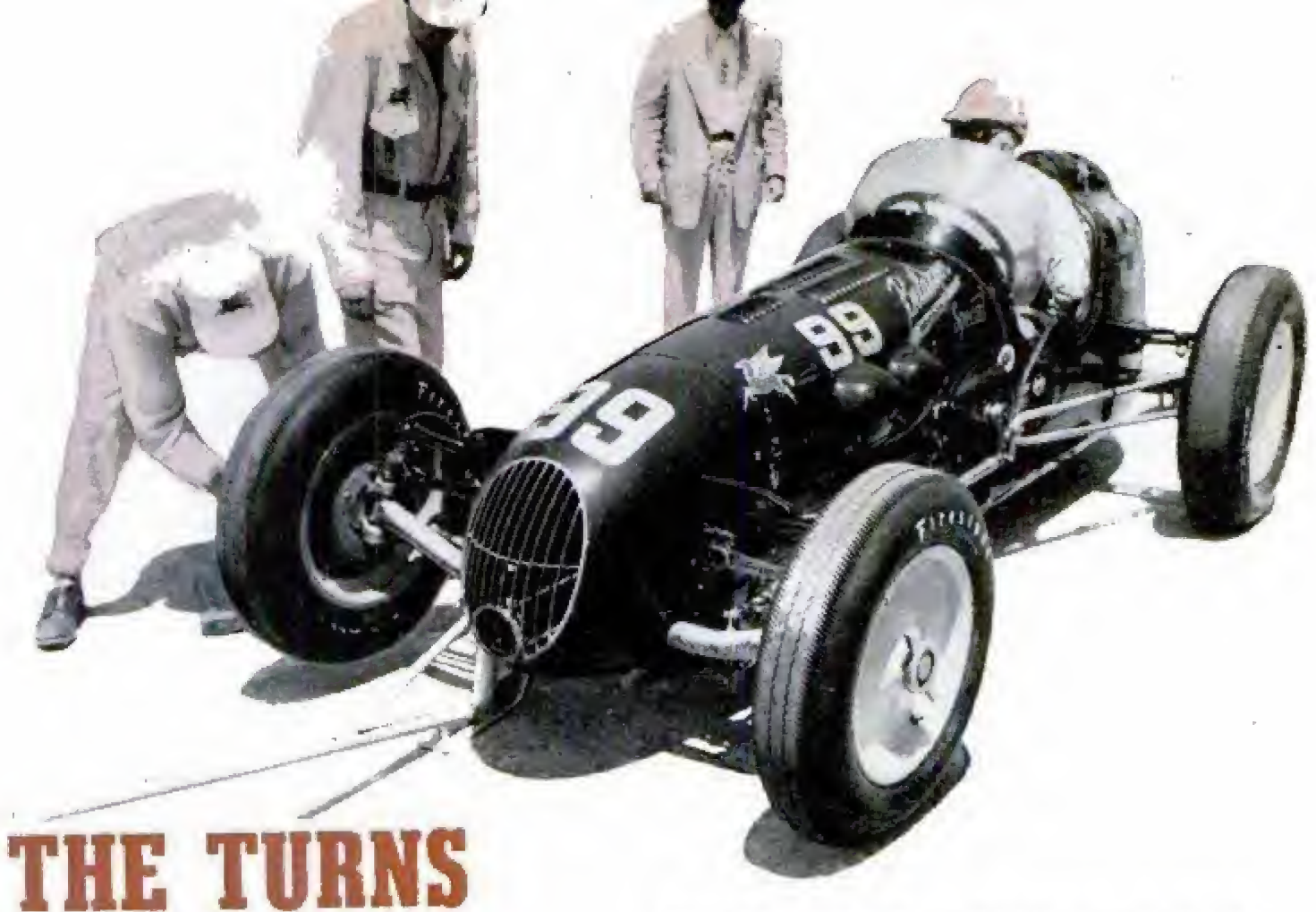
Never before have so much money, engineering brains and shrewd planning been devoted to America's blue-ribbon speed classic. Some 80 cars are entered, 30 of them brand-new creations built during the last few months. Only 33 cars, the winners of 10-mile qualifying-time trials, will start in the race itself.

Not only is the field the largest and flashiest in history, it represents the widest variety ever to compete at Indianapolis.

Most of the cars are powered with the four-cylinder, 270-cubic-inch Meyer & Drake racing engine that develops some 325 horsepower. Arrayed against this favorite will be a 176-cubic-inch supercharged Meyer & Drake, a turbosupercharged 350-horsepower Cummins diesel engine, a rebuilt DeSoto, a Cadillac engine sleeved down to meet specifications, a special overhead-valve Studebaker engine, possibly a



Diesel-powered car measures only 28 inches high at top of cowl. Diagram shows engine tipped on its side to lower the center of gravity



THE TURNS

Simple skid jack slides under the car to raise it for wheel change. Race can be won or lost in pits

double overhead-cam Mercury and at least one 12-cylinder Italian Ferrari. Also in the competition will be the pair of veteran Novis, the low-slung front-drive cars with supercharged V-8s that develop some 550 horsepower.

Last year's winner drove at a speed thought to be impossible for the Indianapolis track a few years ago, and this year the pace should be even faster. Drivers are guessing that it will require an average speed of 128 miles per hour to win the race, with the usual reservations for bad weather or wrecks. This would be two miles an hour faster than last year. This year the fastest car in the time trials may qualify at 140 miles per hour, another record.

One of the reasons speeds are on their way up is because of the trend toward lightweight cars. Several years ago the average Indianapolis car weighed 1800 pounds. This year the average car will weigh some 1600 pounds.

A heavy car with a powerful motor can make record time around the track, as shown by the Novis, yet a light car with less power can go just about as fast if the driver takes advantage of his better acceleration when coming out of the turns. In fact, drivers are learning that the race can be won on corners as well as on straightaways.

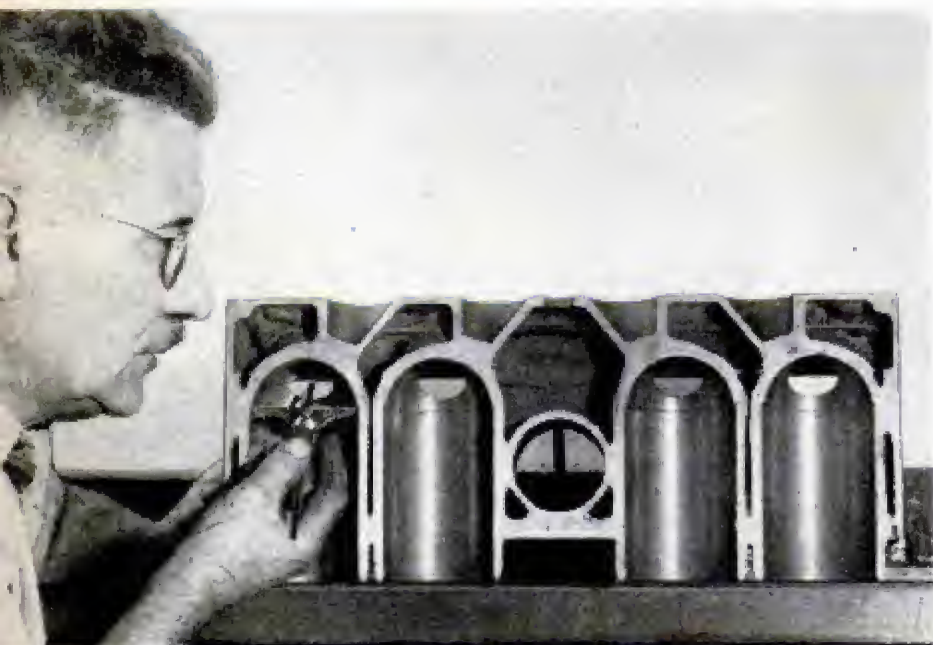
A light car usually can go through a turn faster and under better control than a heavy car, it has better acceleration and its tires don't wear out as rapidly. On the other hand a light car may not be as strong structurally and the driver may not have as good control on the straightaways. Handling a light car is definitely more tiring.

Most of the cars are using magnesium wheels instead of wire wheels this year to save 20 pounds per car. Many of them, too, are using hydraulically operated spot brakes of the aircraft type. These save as much as 40 pounds per car, compared to conventional shoe-type brakes. A spot brake consists of a pair of round pads, or "spots," of brake material which press simultaneously against opposite sides of a steel brake disk that revolves with the wheel. In addition to saving weight, it is said that spot brakes run cooler, stop a car more quickly, last longer and are simpler to maintain.

Many of the cars have gone to large rear axles, three inches in diameter, of chrome-moly tubing with $\frac{1}{4}$ -inch sidewalls. Weighing 32 pounds apiece, they save no weight but are good insurance against breakdowns from the terrific engine torque and the pounding of the fuel load that is located directly over the rear end.

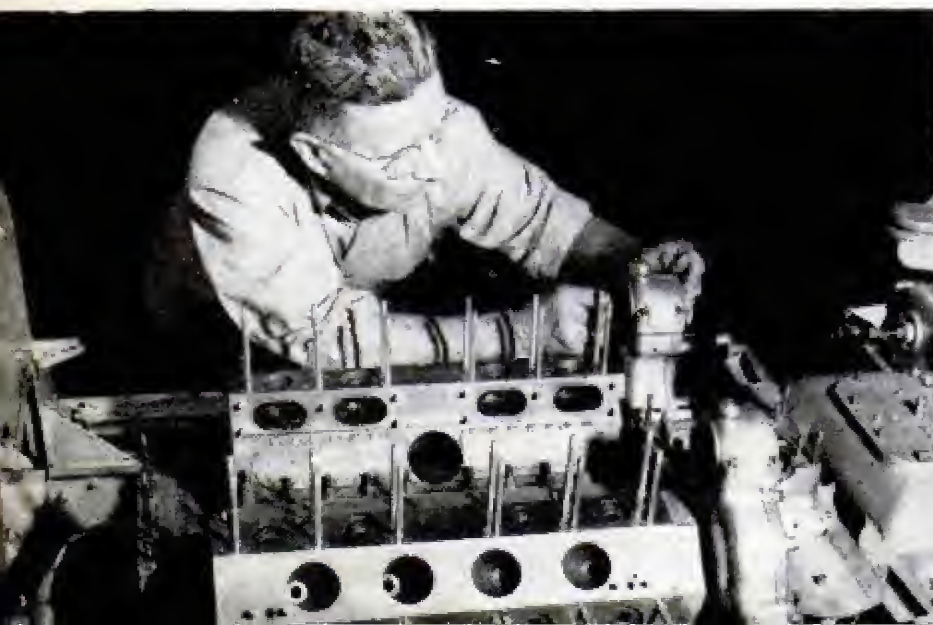


Here's a brand new twin of last year's winner. View above shows same car without body skin. It's driven by 270-cubic-inch engine



Test casting of the V-8 Novi engine, sliced in half for inspection, is checked for accuracy. Note hemispherical combustion chambers

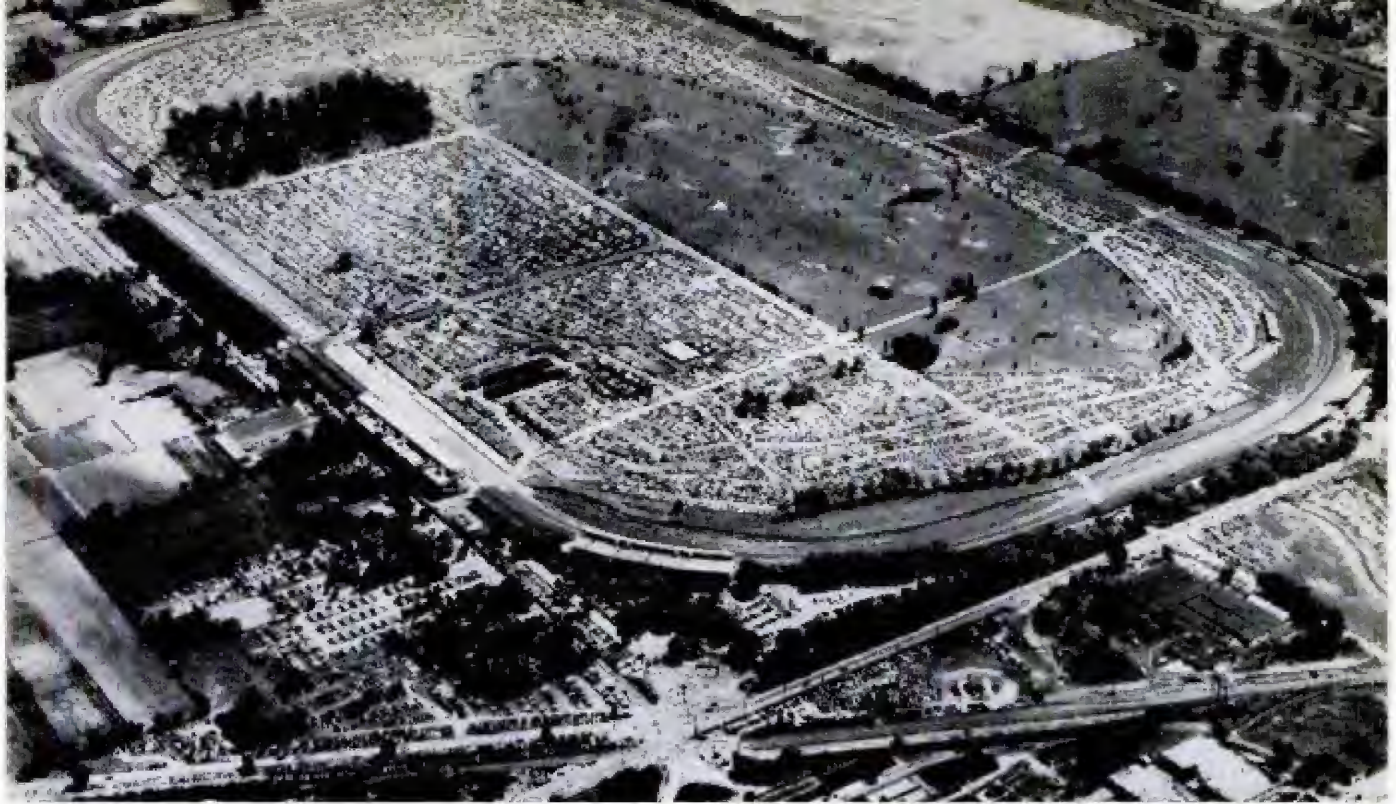
V-8 blocks of the engine are installed in one of the powerful and famous Novi Indianapolis cars. This engine develops 550 horsepower



Frank Kurtis of Kurtis-Kraft, Los Angeles, the country's leading race-car builder, has turned out 17 new Indianapolis cars for various owners since the last race at that track. Nine of them are of the new 4000 series and weigh 1550 pounds each. One will be powered with a cut-down Cadillac engine.

Lighter still will be a pair of the 500 series Kurtis-Krafts that were designed and built early this spring. These cars weigh 1500 pounds each, one being powered with the DeSoto, the other with a Meyer & Drake 270. The cars have frames consisting of a chrome-moly elliptical section plus a nine-inch-deep aluminum-sheet box that serves also as part of the skin. To save weight the cowl and fire wall are designed as structural parts of the frame. Another unique feature is a front-suspension system consisting of two torsion bars mounted in a crisscross fashion instead of parallel to the frame.

The Cummins diesel entry, also built at the Kurtis-Kraft shops, has a 104-inch wheelbase and is powered with a 401-cubic-inch six-cylinder diesel engine equipped with an exhaust-driven turbosupercharger. The car is so heavy (2150 pounds dry) that it can't compete on a pound-for-pound basis with the lighter cars, but its weight was compensated for, in a sense, by installing the heavy diesel en-



Aerial view of track shows grandstand at left, huge public parking area in center. Open area is golf course

gine on its side, in a horizontal position. This change permits an extremely low center of gravity and an offset drive line. The oiling system is of the dry-sump type, so no lubricating problems occur.

The diesel car stands 34 inches tall at the top of its headrest. The cowl is only 28 inches off the ground. Driver Freddie Agabashian almost has to peer out between the tires which stand 33 inches high.

Laying the engine on its side moves the crankshaft, drive shaft, gearbox and differential eight inches left of center, next to the driver instead of under him. About 20 percent of the total weight of the power plant and drive train are moved over. The net effect at Indianapolis will be to reduce the wear on the right tires in the turns, increase the traction on the left tires and permit faster speed around the corners.

Two other cars are using the same idea. One of the Kurtis-Kraft lightweights has its engine tipped from the vertical to permit an offset drive line. Another car, built by Harry Lewis for William Amsted of Indianapolis, has its engine in the conventional position and employs a transfer gear at the rear of the engine to connect with an offset drive shaft. The advantage of this is that the car can be tested with this arrangement and then restored to conventional center-line technique if the shift in weight isn't as effective as is hoped. Veteran mechanics point out that in some cases the idea seems to work, in other cases it isn't particularly effective. In most modern race cars, the same effect is sought by adjusting the left-hand shocks and torsion bars so that more

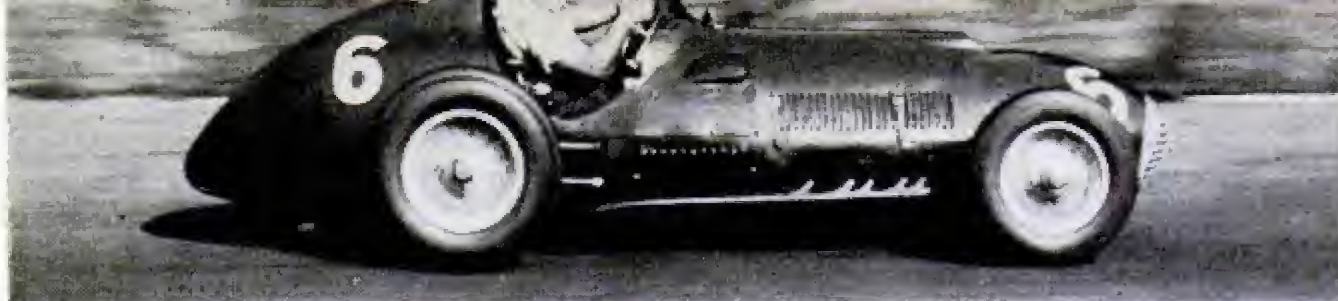
than half the weight of the car is carried on the left wheels.

The Belanger Special that Lee Wallard drove to first place last year won more than \$100,000 during the 1951 season, said to be more money than any race car ever won before. For this year's race, Lou Lesovsky of Los Angeles has constructed a duplicate of the car for the Belanger team. Each car weighs about 1600 pounds, is of chrome-moly-tubing construction and is powered with a 270-cubic-inch Meyer & Drake.

One of the cars to watch will be the Ferrari which has a straightaway top speed of 173 miles per hour. Its 12-cylinder engine develops 380 horsepower at 7500 revolutions per minute. The car has a four-speed transmission mounted integrally with the differential in the rear of the car. Rear suspension is of the European De Dion type with transverse leaf springs, an arrangement that materially reduces the amount of unsprung weight. Two Ferraris placed first and second in last fall's 2000-mile Mexican road race. The Indianapolis entry is being driven by Johnny Parsons, 1950 winner.

Last year's race took a terrific mechanical toll and only eight cars were still running at the finish. Twenty-five broke down for such reasons as broken crankshafts, rods and pistons, overheated engines and cracked rear ends. This occurred partly because of the rule preventing changes in gear ratios or tire sizes after the qualifying trials.

The Indianapolis race is both a speed and endurance contest. Smart owners and mechanics try to figure out how fast they'll have to go to win, then select a gear ratio or



Crouched in cockpit, driver in last year's race pours on the speed as he comes out of a turn. This year cars will be built lighter, will negotiate turns faster

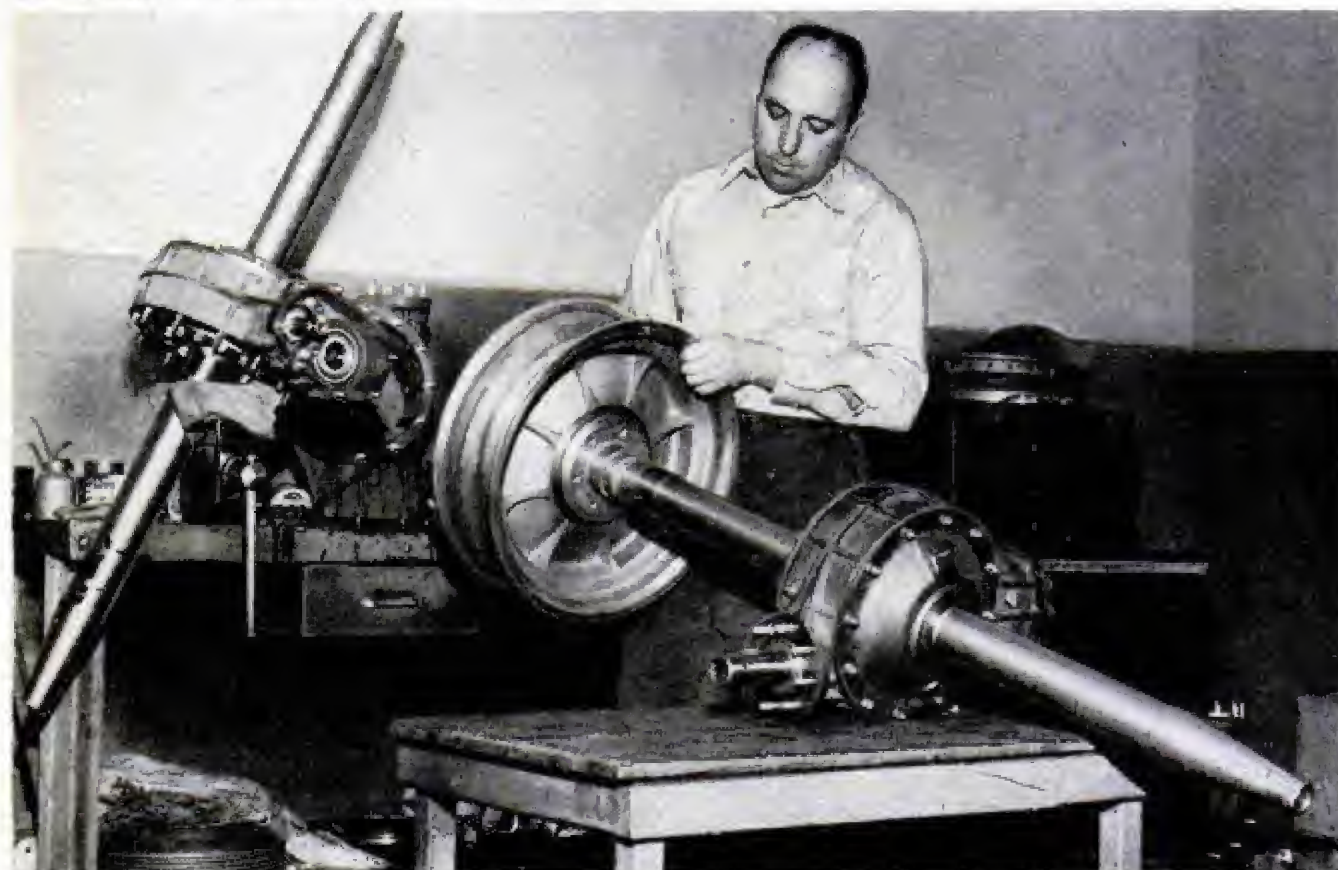


Spot brakes to be used this year consist of two cylinders which clamp the opposite sides of a steel disk

Car builder checks the fit of a new magnesium wheel on three-inch hollow chrome-moly axle. This year cars will average 200 pounds lighter than former racers

tire size that will give them the needed speed without winding up their engines too tightly. A high gear ratio gives speed and reliability but less acceleration, a low gear ratio gives speed and acceleration and also increases the chance of breakdowns because of increased engine revolutions. Last year most of the cars used fairly low gears. The mechanics figured that it was better to use a low gear and go fast enough to qualify—and later take a chance of hanging together during the race—than it was to start with a high gear and get left out completely. This year rules permit changing tire sizes or gear ratios after qualifying rounds.

Most of the cars will make their qualification runs equipped with fuel-injection systems using straight alcohol as fuel. This combination gives the highest-possible horsepower, an aid in making top qualifying speeds. Then, for the race itself, the cars will be changed over to standard carburetion and a gasoline-alcohol-benzol fuel blended in proportions of 40-40-20. This blend provides plenty of power and gives about twice the miles per gallon possible with alcohol alone.



Black print with a white spot denotes negligible radiations in the area (1 to 10 roentgens)



Gray print with a white spot is evidence of a moderate amount of radiation (10 to 30 roentgens)



When print is all white or very light gray, it denotes that the radiations have been dangerous



"Print a Minute" Camera Acts as Atomic-Radiation Detector

Owners of Land "print a minute" cameras can convert them for use as radiation detectors with a clip-on device that glows when struck by radioactive rays. So equipped, the camera detects and measures the amount of atomic radiations in its vicinity after an atomic explosion. As the material glows, it exposes a tiny spot on the film, against which it is positioned. When the film is developed, this spot can be seen and its contrast with the surrounding area in-

dicates the radiation intensity. Because prints are developed in the camera, the tell-tale provides a quick test for radiation. The camera is left folded when used for this purpose. The material is clipped to the inside of the lensboard just to one side of the lens. When the camera is folded shut, the clip is adjacent to the film. It does not interfere with normal use of the camera. The detector clips are supplied to Land owners free of charge by the camera manufacturer.

Blueprint Slipped From Filing Cabinet Without Removing Others



Up to 1000 blueprints may be filed in a new office cabinet which prevents wrinkles, creases and curled edges. The cabinet also is useful for storage of drawings, photostats and charts. Manila hangers are fastened to the items to be filed. Holes in the hangers slip over metal rods inside the cabinet. Any blueprint may be located immediately through an index file and can be taken from the cabinet without removing any of the others. The file accommodates drawings and blueprints up to 48 by 72 inches, and is provided with index cards and lock.

Sun Has Carbon Monoxide

There's carbon monoxide on the sun. Using a spectrometer and a lead-sulphide photocell, astronomers at the University of Michigan have identified carbon monoxide in the sun's atmosphere. Because of the heat of the sun, most of its atmosphere is made up of individual atoms, but carbon monoxide is stable enough to hold together. The discovery may yield more information on the temperatures and pressures of the sun's atmosphere and the abundance of carbon and oxygen in the sun.

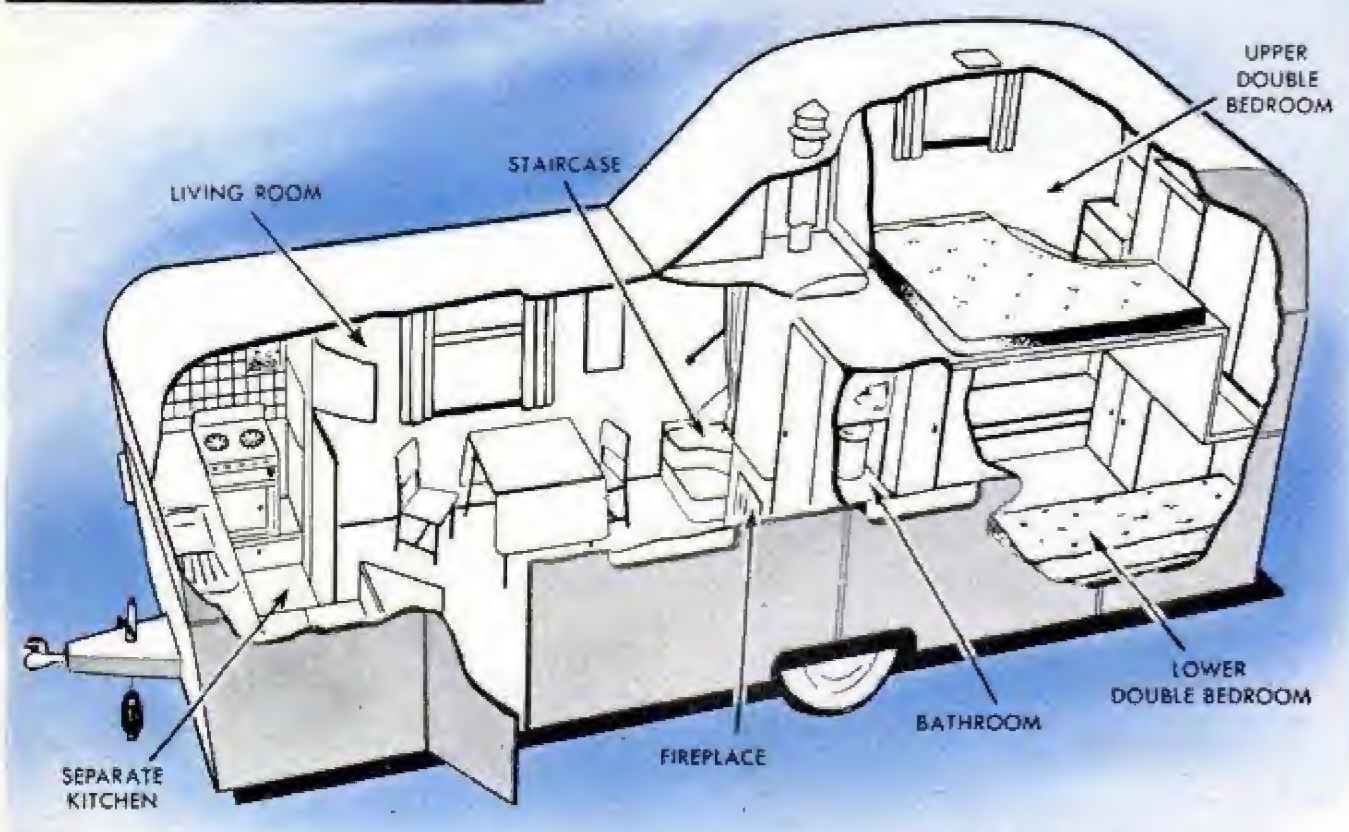


Only 24 feet long, the two-bedroom trailer maneuvers easily. Its over-all height is 12 feet 3 inches, including the chimney

Two-Story British Trailer

YOU GO UPSTAIRS to bed in a roomy British trailer built as a comfortable family residence. Two full-time double bedrooms eliminate the nuisance of converting living space into sleeping space nightly. The upper room is reached by a stairway from the living room. Other features of the trailer, which is called a caravan in Britain, are a complete bathroom, separate kitchen and a wood or coal-burning fireplace.

Left, stairway to second-floor room can be seen to the left of the fireplace. Below, a cutaway view of the roomy trailer



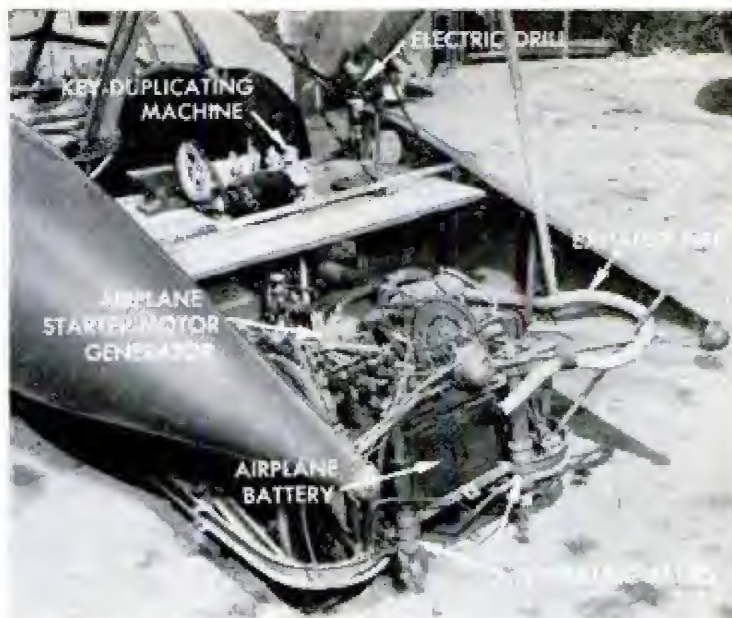
Retired Sailor Builds Cars For Handicapped Veterans

Using surplus airplane parts almost exclusively, a retired Navy chief petty officer builds oversize motor scooters for handicapped veterans. Also built into the compact vehicle are small power tools such as a jeweler's lathe, a key-duplicating machine, a knife-sharpening outfit and a shoe-repair kit so the veteran can earn his living right inside his car. The retired sailor, Edward T. Adkins of Watsonville, Calif., started to build the first vehicle, which he calls the "Vetmobile," while a patient at a Navy hospital. He did it to get a fellow patient, a discouraged amputee, "interested in something." The tiny cars are made of a drop tank split lengthwise and mounted on a strengthened motor-scooter chassis. A converted auxiliary starter-motor generator from a B-29 powers the machine. One Vetmobile built for a Dallas, Tex., amputee is equipped with a two-way radio.

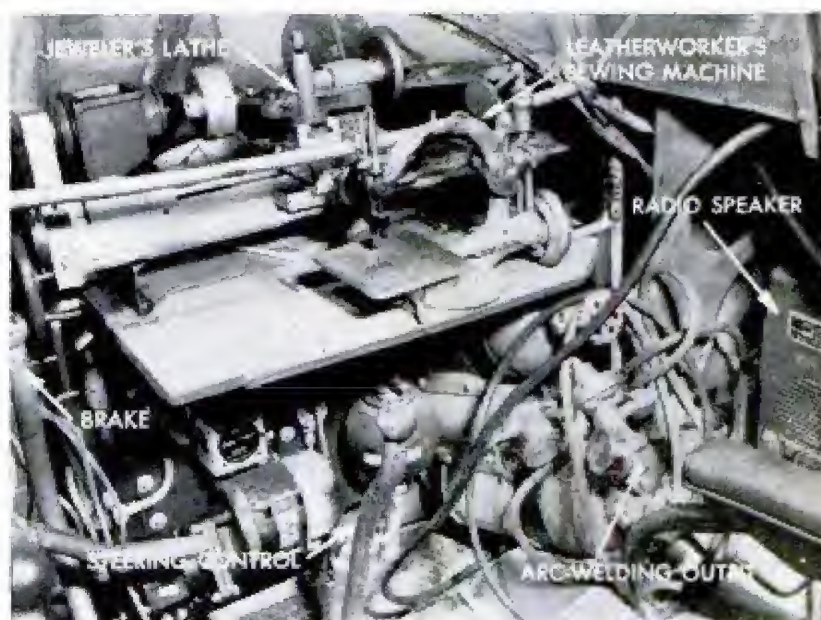
Belgian Helicopter Mail Service

In its first year of operation, a Belgian helicopter mail service covering a 268-mile route around Brussels has handled about 4,630,000 letters. The route connects Brussels and eight other Belgian cities. Only two helicopters are used in the operation which handles a daily average of 400 pounds of mail. The 268 miles are covered in 4 hours and 42 minutes, including loading, unloading and servicing time, for an average speed over all of 63 miles an hour. The service is operated by the Sabena Belgian Airlines. Bell 47-D1 helicopters are used.

Sources of available products described in this issue are indexed on pages 12, 14 and 16. Sources of further information on other articles are listed in the WHERE-TO-FIND-IT LIST, which is available from Bureau of Information, Popular Mechanics, 200 East Ontario St., Chicago 11



Power plant of the beefed-up motor scooter is a converted starter-motor generator from a B-29, operated by a battery



Inside the cab there's little room to spare. In addition to the scooter controls, there is a variety of power tools for the vet



It may look like a machine gun, but it isn't. It's the antenna for the two-way radio. Seated in the cab is Ed Adkins, builder of the "Vetmobile"



THE GRANDPAPPY of all government services to become known by initials is R. F. D. which, everybody knows, stand for Rural Free Delivery. It began in West Virginia in 1896 as an experiment by the Postmaster General, and in one year expanded to 29 states. Today there are over 32,500 routes which serve 8,192,545 families. That means millions of mailboxes, and some of them are imaginative and artistic creations. The standard R. F. D. box is made of galvanized sheet metal and conforms to post-office regulations, but the Office of the Postmaster General permits the use of homemade boxes which conform in a general way to the standard box. Pictures on these pages show unusual boxes found along country byways



Left, one owner made replica of his home into mailbox; right, boxes on wheel are handy for the mailman





Rustic old-oaken-bucket-type well shelters mailboxes



Seven mailboxes repose cozily in this "doghouse"



Model of an early mail coach makes unique mailbox. Below, contractor adds a steam-shovel touch to box



A retired minister fashioned this model of church to hold the mail. Below, occupation of owner not known





Walking and running are among best conditioners. Vary former with deep breathing, stretching and walking on outside edges of feet to strengthen ankles. If forced indoors you can jog in place, quicken pace, slow down to jog, then speed up until tired



HOW TO KEEP

*his books published by:
C.V. Mosby Co.
3207 Washington Ave.
St. Louis 3, Mo.*

By Thomas K. Cureton
Director, Physical Fitness Laboratory
University of Illinois

HALF THE NATION'S manpower is "dead"—in terms of physical fitness—at 40 years of age.

That isn't a wild statement phrased to attract headline writers. It is what I've found during 25 years as a professionally trained physical-fitness researcher, and in putting 40,000 men of varying ages through 14 and 18-item fitness tests. Many of them were world-famous athletes but the vast majority were average male adults. They couldn't swim and wouldn't have been able to run a mile in 10 minutes if their lives depended on it.

Most of us voluntarily stop living to the full extent of our physical potential well before we hit life's midway mark. We half-live the remainder.

There is nothing mysterious or difficult about getting, and staying, in shape. It means exercising more and, generally, eating less. Fortunately, too, it is inexpensive. Many of the most helpful aids, rhythmic exercises like walking, dancing, cycling and swimming, are free or nearly so. One of the very best, pushing away from the table when your actual food requirements are satisfied, even saves money.

One of several endurance tests in the fitness laboratory, a treadmill shows the length of time subjects can run up a grade at varying speeds





FIT

AT 50

When possible, cross-country running provides opportunity for sunshine and exercise. Here author Cureton jumps a fence during a regular run through fields near the campus

Don't misunderstand me. I heartily agree that eating is a pleasure, but overindulgence defeats its purpose. Paradoxically, not only does the average American overeat, but he permits his body machinery to deteriorate to the stage where it doesn't get maximum benefit from what is consumed. Without good circulation, for example, even the very best diet isn't accomplishing what it should for you, no more than top-grade fuel can correct all the troubles of a defective engine. Only a well-conditioned body uses food efficiently.

Too long an abdominal girth is also likely

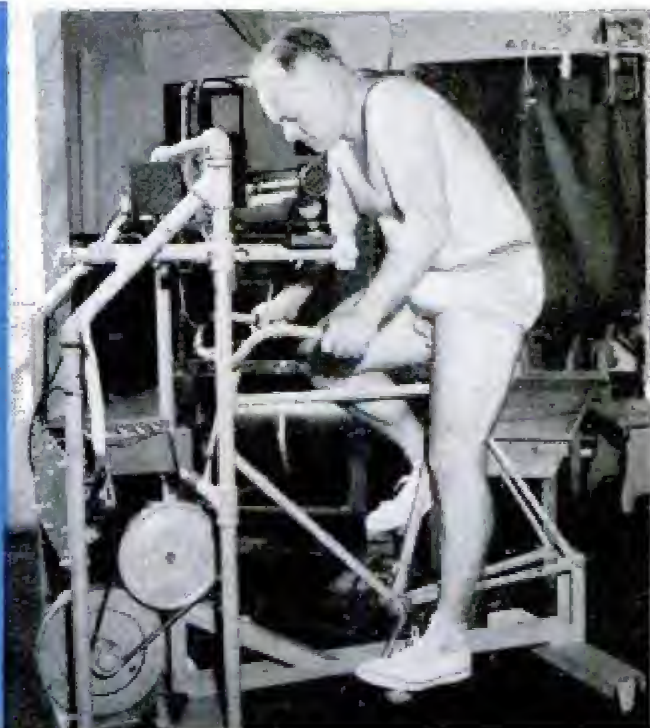
to mean a too-short lifetime. Insurance-company statistics indicate that men who are 35 percent or more above the average weight for their age and height also have a 150-percent-higher mortality rate.

We can all delay the onset of old age's physical and psychological problems 10 or 15 years by following a simple, planned fitness program. Don't expect "to find time to exercise"; people rarely do. That's wishful thinking. To stretch out your vigorous

As a stamina test, subject pedals an ergometer bike as long as he can against a fixed amount of resistance



This isn't for beginners in a physical-conditioning program. Called the extension press-up, the subject has his arms at full reach and toes slightly hooked under as he raises his trunk parallel to the floor





From a sitting position on the floor, rhythmic bending for five minutes twice daily exercises the oft-neglected abdominal muscles



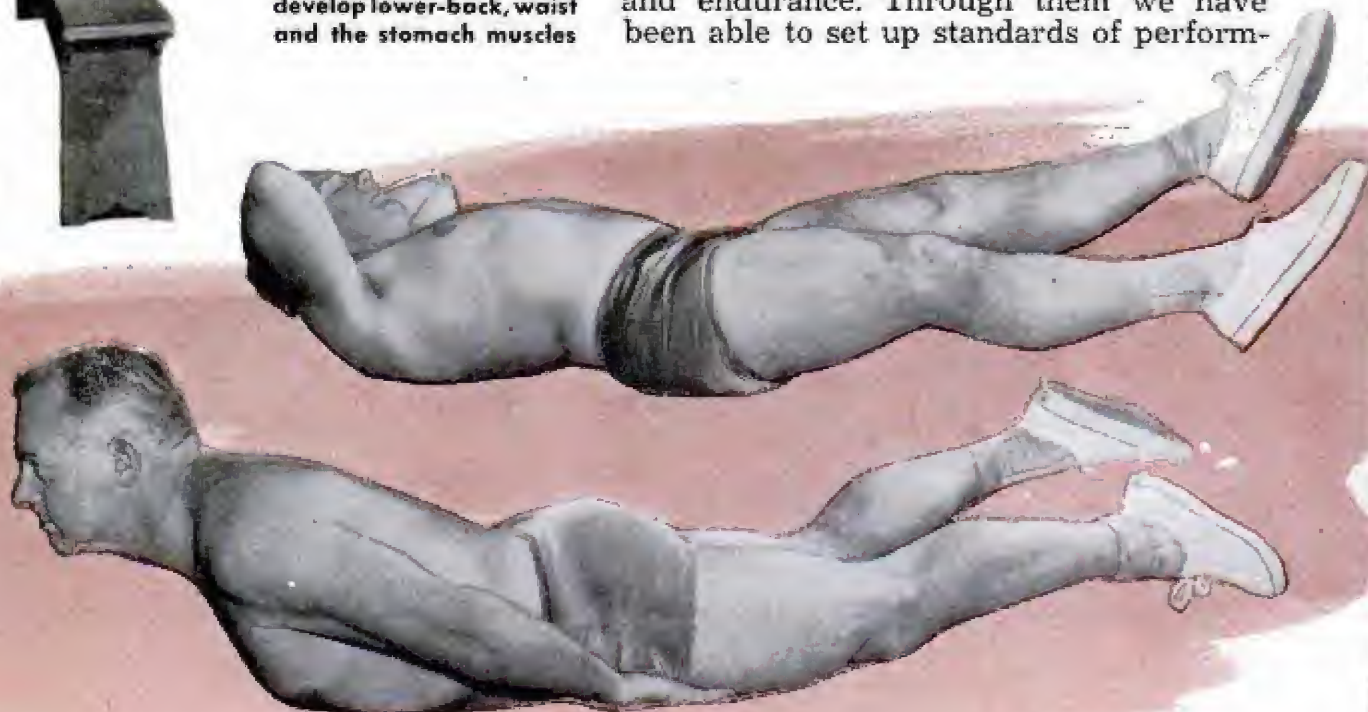
High among endurance builders is a step test, left. Practiced once or twice a day, it consists of stepping onto a chair or bench, using each leg alternately, at a rate of 30 steps a minute for periods of five minutes

Flutter kicks, done on the back and the stomach as many times as possible, develop lower-back, waist and the stomach muscles

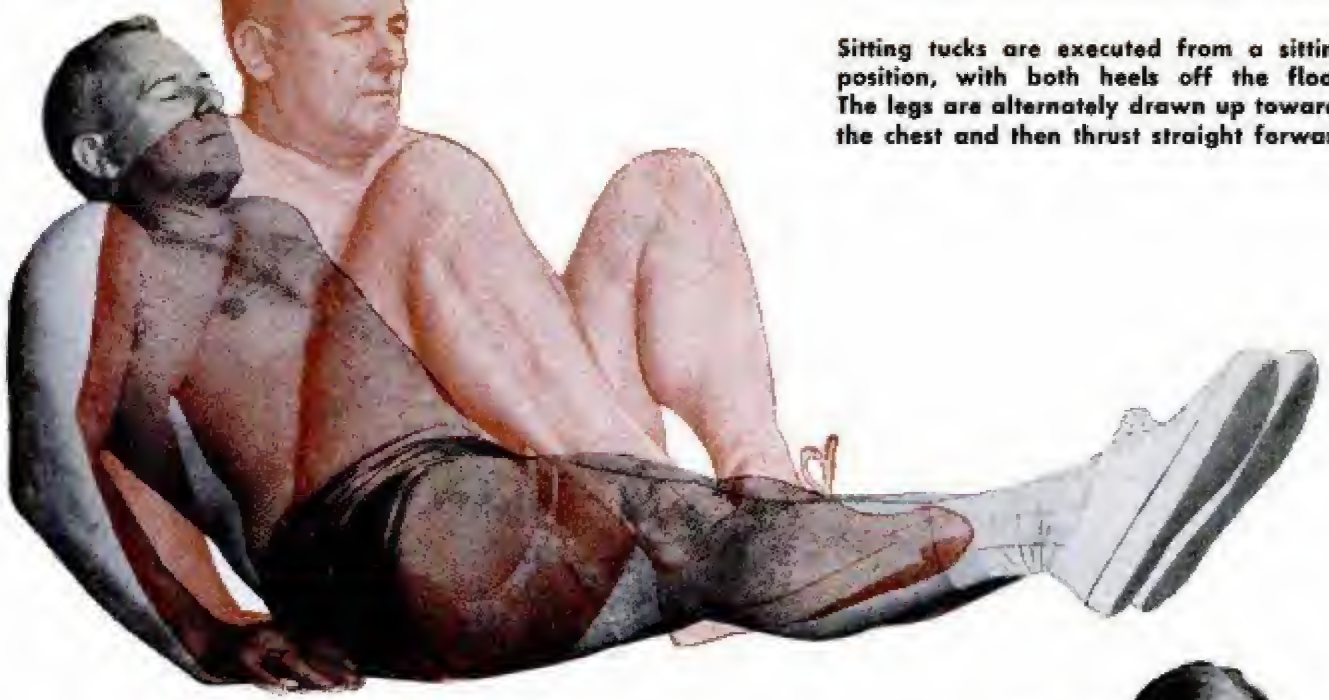
years you have to take the time to exercise, regularly allotting about two hours daily to physical work.

The classification middle-aged, often used as an alibi by those anxious to avoid exercise, can be misleading. I've known men in their 20s who were "middle aged," and others in their 40s with the mental and physical well-being expected in fellows half their age. I'd say the term might apply generally to the 26 to 60-year group.

In the last 10 years, the physical-fitness research laboratory I direct at the University of Illinois has tested more than 7000 men. Our job is "human engineering"—the study of physical efficiency, condition and work output. Through long research we have evolved tests that represent balance, flexibility, agility, strength, power and endurance. Through them we have been able to set up standards of perform-



Sitting tucks are executed from a sitting position, with both heels off the floor. The legs are alternately drawn up towards the chest and then thrust straight forward



ance to determine a person's motor fitness.

Along with standard gym gear like mats and horizontal bars, the laboratory has extensive scientific equipment such as apparatus to determine blood factors, an electrocardiogram machine and a photoelectric instrument which measures the oxygen content of arterial blood as it passes through the ear.

Our steady stream of volunteer subjects has included students, laborers, business and professional men, policemen, firemen and servicemen. To get a further basis of comparison I've tested and examined the stars of previous Olympic games, and I'm continuing the project in Europe this year by testing the former champions from nine countries. At the top end of the ladder, we want to determine the basic physiological reasons for the exceptional abilities of these superathletes.

Working with all these people, we've been able to reach solid conclusions as to what a man's physical abilities should be—relative to his age, physique and other natural circumstances—as well as what they actually are. The evidence shows clearly



Performing squat jumps to limber up the legs and trunk, subject touches all fingers to the floor with one knee forward. He springs clear of floor and straightens up, repeating with the other knee forward

Many of the trunk muscles get a thorough flexing during the easy leg-raising exercises done on side





Olympic swimmers have aided the laboratory as test subjects. In experiment above, a swimmer is being held in position while apparatus held by man on board is used to gauge his oxygen intake

Close-up, left, of mouth-breathing equipment as used by swimmer in test

Assaying the proverbial "pound of flesh" is a calipers for measuring the fat layers covering body



that too little hard work and exercise, not too much, is what kills off the middle-aged or heads them for an early grave.

Sometimes a man tags himself as a "has been" when his first attempts at exercise, after years of inactivity, end with sore muscles and an aching back. He may even talk himself into interpreting those discomforts as danger signs, warnings that he is too old to flex his muscles even slightly. Generally that is a lot of poppycock. That soreness comes from sluggish circulation and overstretched muscles. It'll disappear when the heart, strengthened by exercise, starts pumping more blood and the tissues themselves make a gradual adjustment.

I don't urge going all out when you first start putting a rusty physical system back to work. Take it easy and gradually work up to the level of your abilities. Nature has many safety checks and you'll almost invariably find yourself stopping well before your heart is even close to giving out.

Age is no barrier if you're sincere about wanting to regain good physical trim. A fairly typical case involves a 59-year-old professor who came to us complaining of weak and painful feet, high blood pressure, insomnia and overweight. A little gardening and occasional fishing and canoeing about summed up his recreation. So far as regular exercise was concerned, he was a total abstainer. The deaths of several sedentary friends during the year turned him to us for a checkup and advice.

After an examination and interview, we recommended a program consisting of:

1. Two miles of walking daily, to and from work.
2. Home calisthenics before breakfast and before retiring.

(Continued to page 250)



Portable Rim-Circle Saw

Felling trees up to 30 inches in diameter, a one-man saw cuts from any angle. Its thinness permits cutting trees close to the ground. Powered by a one-cylinder gas engine, the saw weighs only 85 pounds



when used with a 3.6-horsepower engine, and only 76 pounds when used with a 2.2-horsepower engine. The 30-inch blade, with its outside cutting teeth, is held in place by three steel ball-bearing rollers. An aluminum-alloy frame guards the blade. The saw also can be used for cropping limbs.

Vacuum Cleaner For Animals

Cows and other animals are cleaned with a new vacuum unit designed especially for the work. It contains a baffle that stops most of the dirt, collects it and then permits the air to escape. The filter in a conventional vacuum cleaner would soon be clogged with dirt if used on animals. In addition to its use on cows and show cattle, the device is being used to clean brooder houses and to vacuum dogs at a boarding kennel.

Synthetic Remedy for Malaria

From hydrangeas that bloom at Easter, a team of scientists at the Lederle Laboratories has developed a potentially powerful synthetic remedy for malaria. Called Ch'ang Shan, the drug is the result of over five years' work by the scientists who started their research activities as a result of the shortage of quinine during World War II. Tests on laboratory animals indicate the synthetic drug to be 80 to 100 times more effective than quinine which has been in use for centuries.



□ A patent has been granted a device that opens and closes the door of the doghouse when the dog steps into or out of his bed.

There's a Knack to Mountain

EVERY SUMMER millions of tourists pour through the high passes of our Western mountains. And every summer highway patrolmen, picking up battered wrecks on hairpin curves, are more convinced that mountain driving is a lost art.

Year after year rangers in our loftier national parks, as well as truckers on our great deserts, stop to advise drivers how to handle a vapor-locked fuel pump or a boiling radiator.

Actually, mountain driving need be no more difficult than rolling across the flat lands. And statistics show that crashes are less likely on mountain grades than at city intersections. With a little planning and care, most accidents and mechanical failures in the mountains and the deserts could be avoided.

With this in mind, I drove across the Great Salt Lake Desert and into the heart of the Colorado Rockies to assemble up-to-date tips from the experience of rangers and patrolmen, truck drivers and garage mechanics, auto engineers and just plain, ordinary drivers in trouble.

One thing stood out: "Don't fail to visit the mountains just because you feel the high roads are dangerous," said expert after expert. With one exception, driving

Two were killed when this car plunged into a ravine in rough country, where one mistake can mean tragedy



By Verne O. Williams



is not a bit more dangerous simply because of the altitude. Quite likely this is true because other drivers on the road also become more careful when the drop beyond the guard rail is a thousand feet or so.

This exception is a curious phenomenon. A couple of cocktails taken in Denver at an elevation of 5000 feet can hit a driver much harder an hour later at 10,000 feet in a mountain pass. This is because the intoxicating effect of alcohol increases with altitude. So, as one patrolman put it, "Keep the antifreeze in the radiator."

Actually, this isn't good advice either, because such alcoholic antifreezes would boil too readily at high altitudes to be safe.



Colorado State Patrol photo

A much greater proportion of accidents results from other violations of the mountain-driving code. The Colorado Highway Patrol cited three frequent errors in the order of their seriousness:

1. Stopping the car on the highway to stare at an entrancing bit of scenery, sometimes the last seen in this world;

2. Driving on the wrong side of the road, occasionally through a psychological fear of the drop, but more often because of speeding around curves;

3. Coasting merrily down steep grades with the engine out of gear and providing no braking effect.

Little can be said about pulling off the

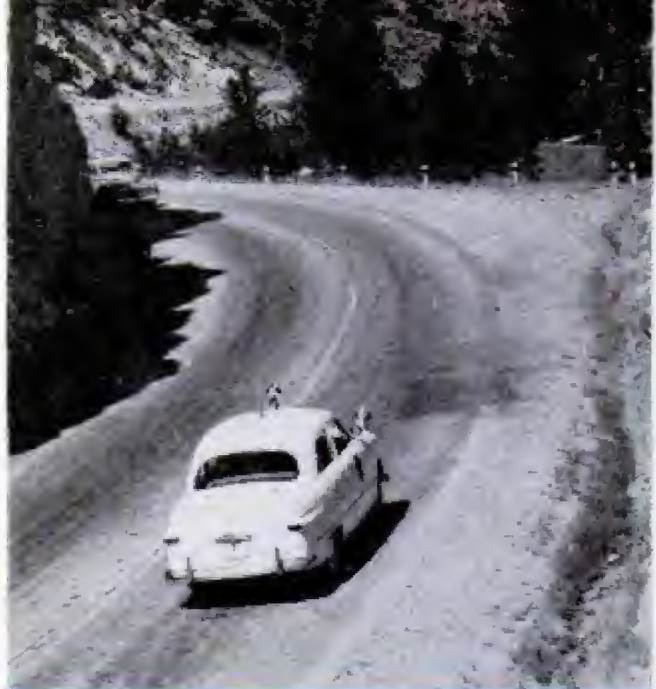
Two cars and a semi-trailer were involved in this crash, resulting from failure of the truck's brakes. Top, a ranger helps cure a vapor-locked fuel pump

road before stopping that hasn't been expounded for years by safety authorities. Not much more can be said about keeping to the right of the center line, except that topflight racing drivers think you should slow down in advance of a curve, then accelerate through it. To which may be appended a warning against ever slapping on the brakes in the middle of a rough, wash-board curve.

During postwar years, to get to the third error, highway patrolmen have discovered



WRONG WAY



RIGHT WAY

Keep to the right of the center line at all times, especially on curves. Car at the left is inviting disaster

that thousands of drivers, who had no intention of doing so, have literally been coasting down steep mountain grades.

This has resulted from the increased adoption of overdrive units on postwar cars. In the old days a man who ordered an overdrive unit usually understood quite well how it worked. Recently, however, rangers in the Rocky Mountain National Park, checking several runaway wrecks at the foot of 12,000-foot-high Trail Ridge Road, highest continuous auto highway in America, found the cars locked in overdrive. Other drivers, who noticed in time

that their brakes were failing, had to be assisted down the grades by a truck linked to the cars with a rope. They also had been coasting in overdrive. Their brakes may not have been good to start with, and gave out under heavy, continual use.

In alarm, park rangers erected two large signs on the lofty tundra's straightaway, warning motorists against making the descent in overdrive.

There was good reason to be alarmed. The overdrive unit on nearly all postwar makes is completely freewheeling up to about 30 miles an hour. After that its brak-

When fog comes in, forget your miles-per-day record. Slow down or, better yet, stop and wait for clearing

This can happen when alcohol and mountain driving are mixed. Intoxicating effect goes up with altitude

Colorado State Patrol photo





WRONG WAY

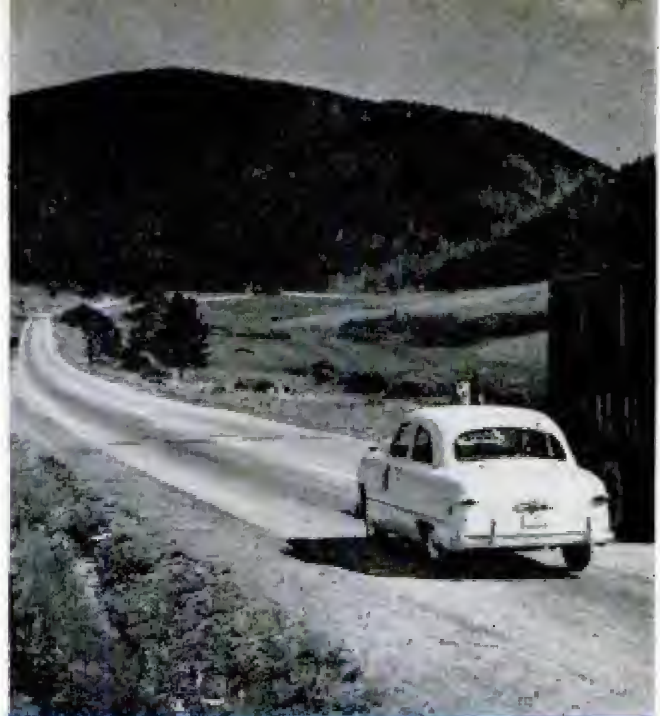
Don't try to zoom by a truck on a winding upgrade.

ing power is proportionate to its lower engine-to-wheels gear ratio and of little help. This leads the inexperienced driver to ride his brakes continuously down steep twisting curves and switchbacks.

The simplest remedy is to take your car out of overdrive, or "cruising gear," before entering the mountains at all. This will also prevent strain on the engine caused by climbing in overdrive.

Don't try to go out of overdrive at speeds above 30 miles an hour unless you have the presence of mind to use a simple trick. If you're whizzing down a grade in overdrive,

It's a long, steady pull on Trail Ridge Road with 15 miles above 11,000 feet. Careful mountain driving pays off here but it need not be any more difficult than driving on flat land if you follow advice of high-altitude drivers



RIGHT WAY

High altitude cuts pickup. Pass only on straightaway

shove the accelerator to the floor. This will snap the unit down into standard drive. Immediately set the knob to lock it there and let up on the accelerator. Neat trick, but it takes nerve on a runaway descent.

Postwar automatic transmissions present a different problem. I talked to a number of owners of late models thus equipped as they paused at a parking area midway down a long mountain grade. Each was satisfied with the performance of his car going up or down. However, one point was driven home quite emphatically.

As I walked around the back of a big





Overdrive is a great fuel saver, but in the mountains forget about economy. Lock it out so the engine will aid in braking



Colorado State Patrol photo

Head-on collisions are often caused by passing on an upgrade but statistics show mountain driving is safer than city driving

Steaming cars are as common as scenic spots but they can be avoided by some pretrip maintenance at your favorite garage



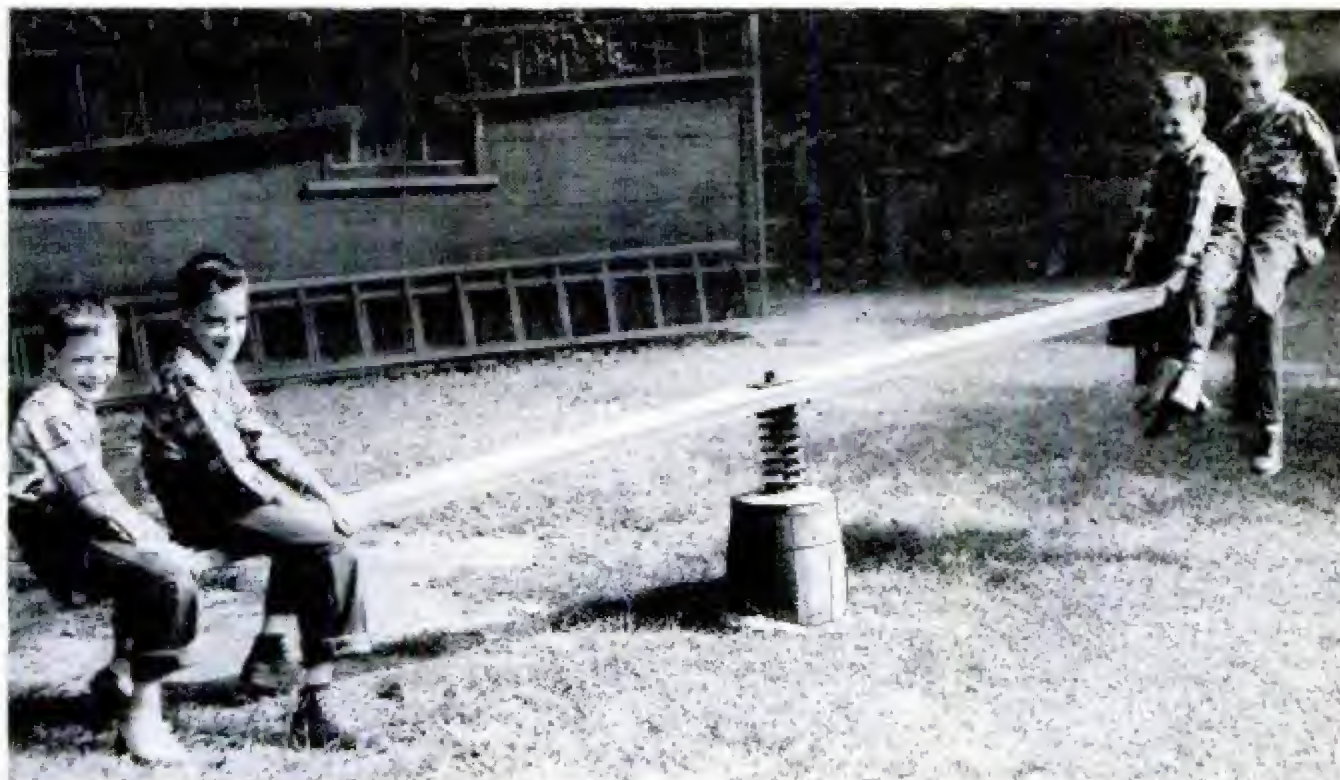
Dynaflow-equipped 1951 Buick sedan to speak to the owner, who had walked a few feet away, the car began rolling slowly backward out of the parking area. Jumping in, I looked for the emergency brake, couldn't find it, so I tromped on the foot brake. The horrified owner ran over and explained that he'd forgotten to slip his automatic transmission into the "P," or parking, position. Fluid drives simply won't hold a parked car on even a slight grade unless set for parking.

Likewise, such transmissions don't hold back as much as a conventional high gear when descending, largely because of the lower axle ratio. Therefore, for really steep grades these automatic shifts should be slipped into the low position. This will actually yield a gear ratio close to the average car's second gear, once you get up a little speed. There are some nearly perpendicular roads in the mountain country where these cars are really going to wear out their brake linings.

Also, if you've ever tried to drop back into low range in a clutchless model at 25 or 30 miles an hour, you know how the car heaves and the rear wheels skid when you've shifted. Of course, to shift down in an older model you used a technique known as double-clutching, a stand-by of the trucking lads. Well, you can do something similar in your new clutchless wagon.

Just before shifting from drive

(Continued to page 238)



Seesaw Merry-Go-Round

With an old automobile shock absorber, one ingenious craftsman has built his children a combined seesaw merry-go-round. First he poured a concrete base, using an

old nail keg as a form. Pins set in the concrete are fastened to a long plank, which is supported by the shock absorber. The spring provides live action to the plank when it is used as a merry-go-round or a teeter.

Munich Rail-Station Sign Flashes Hotel Vacancies

Available hotel accommodations are automatically posted on an electric information signboard at the Munich, Germany, railroad station. Room clerks at the hotels dial the number of vacancies available and the type of room. This data is translated into electrical impulses fed to the sign.

Chemical Turns Clods Into Garden Soil

Clay and other poor soils can be converted into lawns and gardens through a new chemical announced by the Monsanto Chemical Company. The chemical, now under test at agricultural experiment stations, is related to materials which are formed naturally in humus by bacteria. According to the company's chemists, even the raw subsoil turned up by steam shovels at new housing developments can be converted into soil suitable for lawns and flower beds. Only a few pounds of the chemical, called Krilium, are required per acre. The soil conditioner changes the



structure of clay, making it porous and crumbly. Krilium will be available only in small quantities in 1952, but will be in full commercial production next year.



Snowshed Protects Highway From Drifts and Rocks

Snowplows don't have to battle tremendous drifts any more along certain stretches of highway in Washington's Cascade Moun-

tains. Highway engineers took a hint from the covered bridge of early America and built a concrete-and-steel shed over part of the highway at spots where drifting is excessive. The roof of the shed also protects motorists from falling rock.



Army's "Hextent"

Soldiers in Korea gave the Army's new "hextent" its first combat-theater testing. The tent has a white lining which not only reflects light better but also provides insulation. Cold air is kept out and warm air sealed in by a ground cloth around the bottom. Included in the complete pack, which weighs 56½ pounds, is a clothesline on which soldiers can dry clothes in the tent.

Ceiling Heater Gives Light, Too

Combining three functions, an all-electric ceiling unit gives heat and light, and circulates the air with a fan. Especially designed for bathrooms, nurseries or other small rooms, the unit will heat up to 400 cubic feet. It is installed flush with the ceiling. The fan draws in air from the ceiling, heats it and gently forces it back into the room. The light is in the center of the unit.

☐ A supermarket in Beloit, Wis., has automatic washing machines so shoppers can have their laundry done while they shop.



RESTORING FADED TAPESTRIES

By Clinton R. Hull

GOOD wall tapestries are expensive and yet, because they fade, many fine old pieces are discarded or tucked away in attic trunks to be forgotten. However, unless the cloth itself is damaged, it's no trick at all to restore faded tapestries to their original beauty, using nothing more than common wax crayons. The first step in restoring any tapestry is to wash it in mild, lukewarm suds and then dry it on a flat surface. Be careful to smooth out the edges so they will be straight and press with a medium-hot iron to remove any wrinkles. Coloring is done on a smooth hard surface, using a well-pointed crayon for following lines and dots. Hold the fabric taut between the thumb and fingers, as shown below, for even coloring and avoid overlapping of different colors on adjacent areas. This is particularly important in retouching faces. Use brilliant colors especially on Arabic,

Best results are had if colored crayons are applied to tapestry with a stroking rather than circular motion



Before-and-after examples show portions of faded tapestry restored to original beauty by crayon coloring

Italian and similar subjects. Although slightly off-color shades usually pass unnoticed on the over-all picture, it is well to check colors beforehand. While any of the colors may be removed with solvent and a blotter, it is not too easy, therefore care should be taken to avoid using the wrong shade. The colors may be more permanently set by covering the restored tapestry with wrapping paper and pressing it with a medium-hot iron. This tends to dull the brilliance somewhat and it will be necessary to again enliven the high lights with additional strokes of the crayon. Unless the tapestry is exposed to unusual wear, pressing is not absolutely necessary and restored tapestries even will stand gentle washing.



PLYWOOD DINETTE

Plainness of line plus a painted finish put this easy-to-build dinette set in the hammer-and-saw class. It's made mostly of plywood

MAYBE YOU want a lift from your present mixed group of dining-room furniture or, possibly, you have completed a new home and are looking for furniture you can build to outfit a small dinette. If so, here is a smart-looking set that is made to order for both the small home and the amateur cabinetmaker. Not only is it a junior size, it also does not require a lot of power tools

to build. Simplicity of design and joinery permits this furniture to be made with common hand tools if necessary. If, by chance, you should have a jigsaw or a bandsaw, for example, it can be used to speed the cutting of the curved parts, although they can be cut with a compass saw. In this case, they are cut slightly oversize, filed to the pattern line and finally sanded smooth. Where the



ENSEMBLE

drawings suggest rabbeted joints and you do not have a means of cutting them, cleats can be substituted where necessary. Thus, for the most part, this furniture can be built with a minimum of tools.

Lumber-core plywood is recommended for the table and chair legs rather than seven-ply material. The former has been found to give the necessary rigidity to this particular unsupported-leg design, and the lamination of the material gives great strength to the chair backs. If your local

PM color photos by Paul T. Hutchinson



Styled by John Bergen

Two-in-one functional unit serves as either buffet or combination china cabinet when topped with separate upper section. Choice is had between this unit and the conventional corner type shown at the left

lumber dealer does not stock lumber-core plywood, he no doubt will be glad to order it for you.

The complete set features seven pieces, which include a minimum of four chairs, table and a choice of either a corner china cabinet or a functional dual piece. The latter is designed to serve alone as a buffet. Complete, it will serve as a combination buffet and china cabinet. Unless your dinette is roomy, you probably will not build both. In the case of the corner china cabinet, the upper part lifts off for convenience during periodic rearrangement of the furniture. The original table top, including the extra leaf, was covered with linoleum and trimmed with a stock metal counter edging. However, the top also can be covered with



Plastic-upholstered seat and back cushions, padded with foam rubber, are easy to clean with a damp cloth. Upholstery is tacked to underside of plywood board which, in turn, is attached to chair with screws

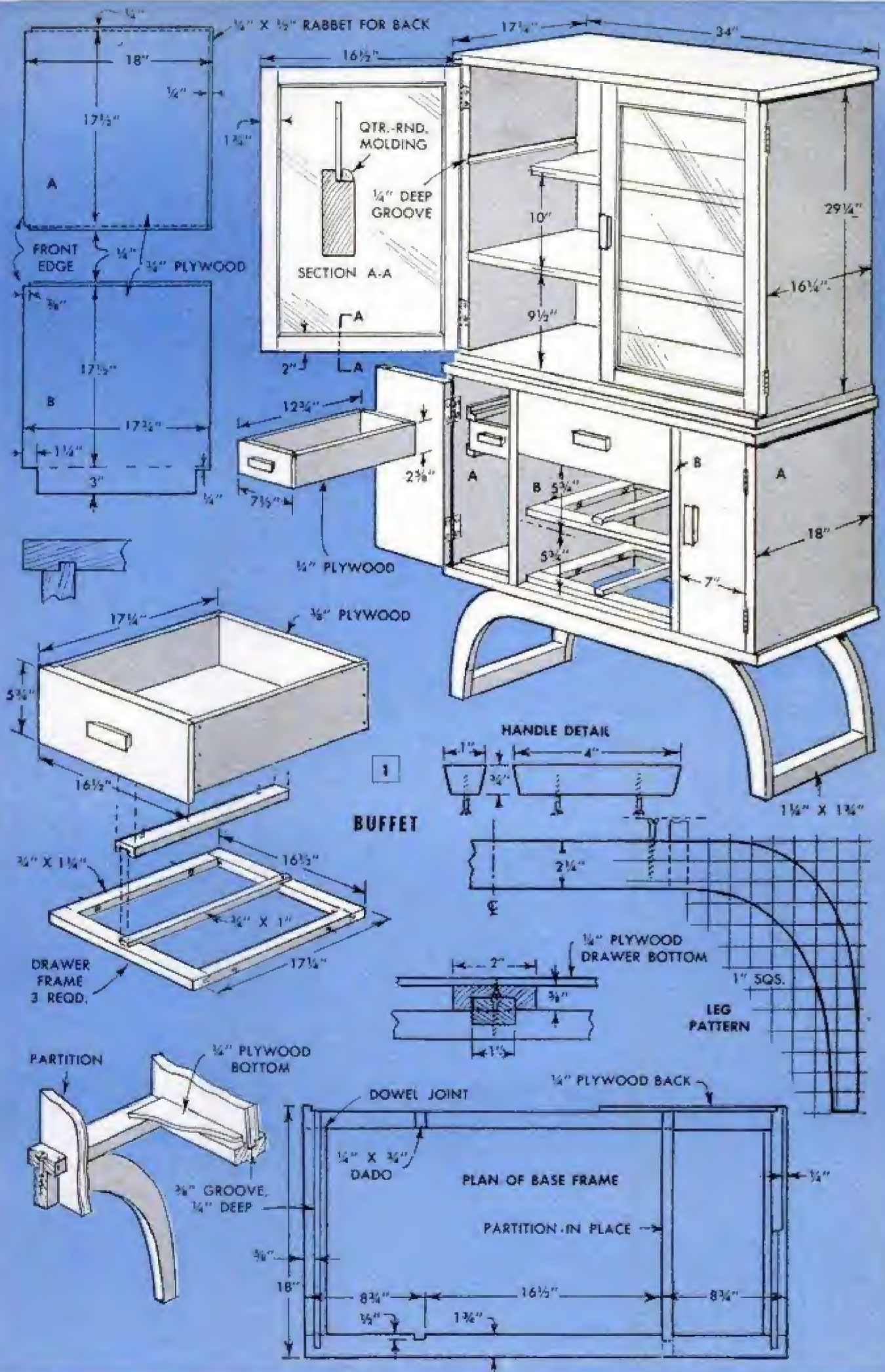
Extension table operating on "lazy tong" equalizer is designed for an extra leaf to increase seating capacity to six persons. Plastic or linoleum top, trimmed with metal edging, matches color keynote

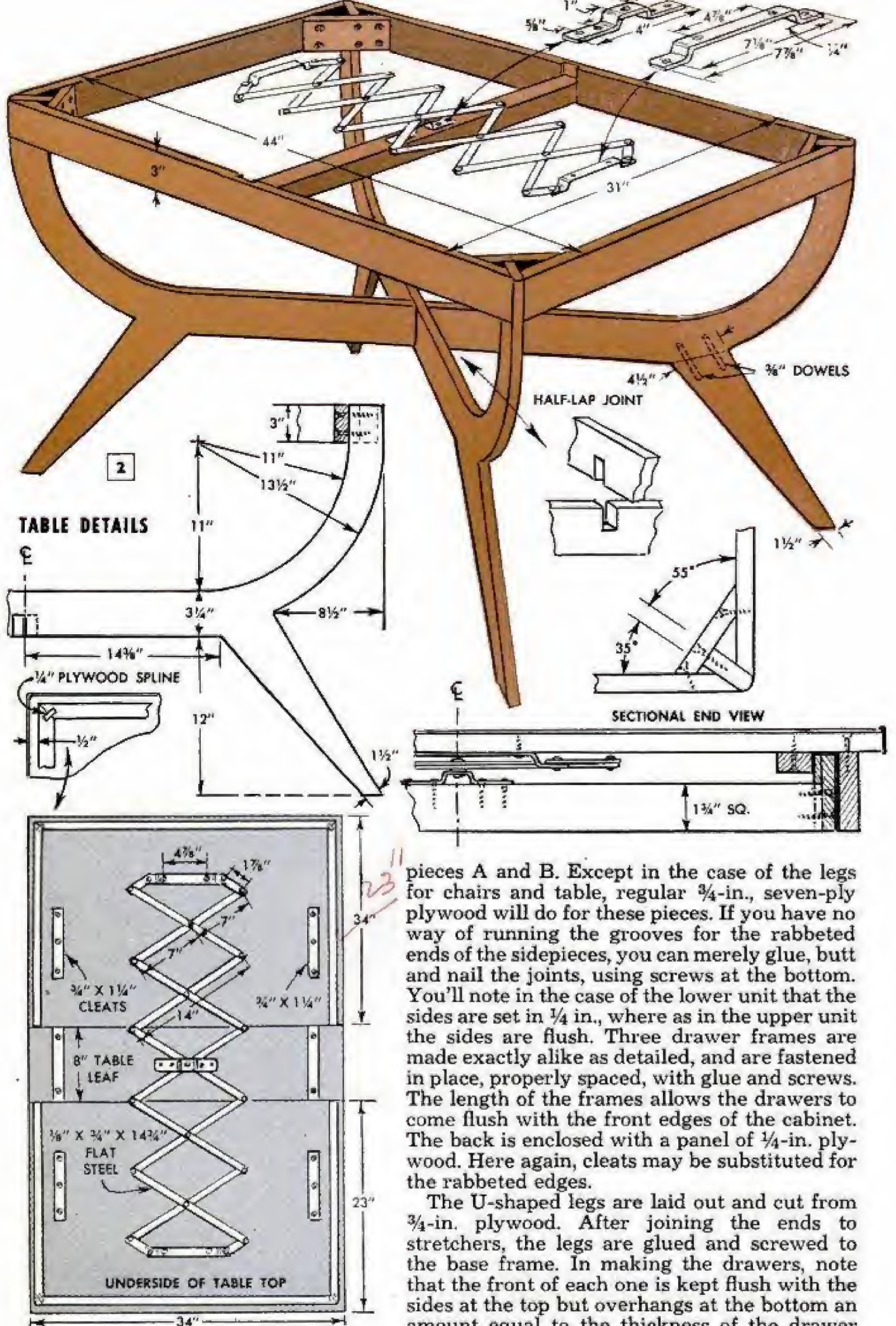
any of the new plastic laminates which are practically impervious to wear. Or, the top surface can be painted like the rest of the table. The two halves of the extension top actually ride on furniture glides applied to the top edge of the table framework, with each section being fastened to a lazy-tong type of equalizer which actuates both sections when one is pulled open. The chairs feature padded cushions consisting of a plywood board upon which foam rubber is placed. They are upholstered with a plastic fabric brought around and tacked to the underside of the plywood. While the original set was made of poplar plywood and was painted cream and blue, it may be constructed of hardwood-faced plywood and varnished or lacquered.

The particular design of the chairs lends itself to mass cutting if a bandsaw is available. Nesting the patterns of identical units to economize on material and then roughing out permits stacking so that four or more units can be cut at one time. It is best to figure on cutting the duplicate U-shaped parts of the table and buffet in pairs to assure identical members.

Buffet-china cabinet: Construction drawings for both units of the combination buffet and china cabinet are given in Fig. 1. Begin the lower unit by first making the base frame which measures 18 x 34 in. over all. This is doweled at the corners and notched and grooved for the sides and partitions,

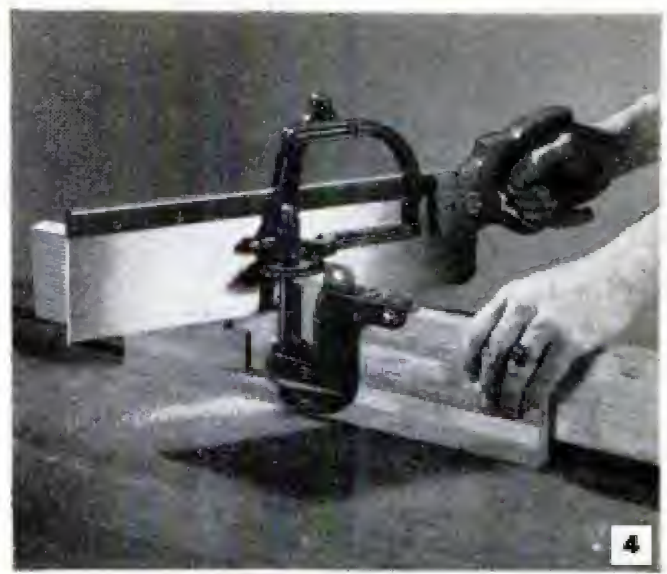
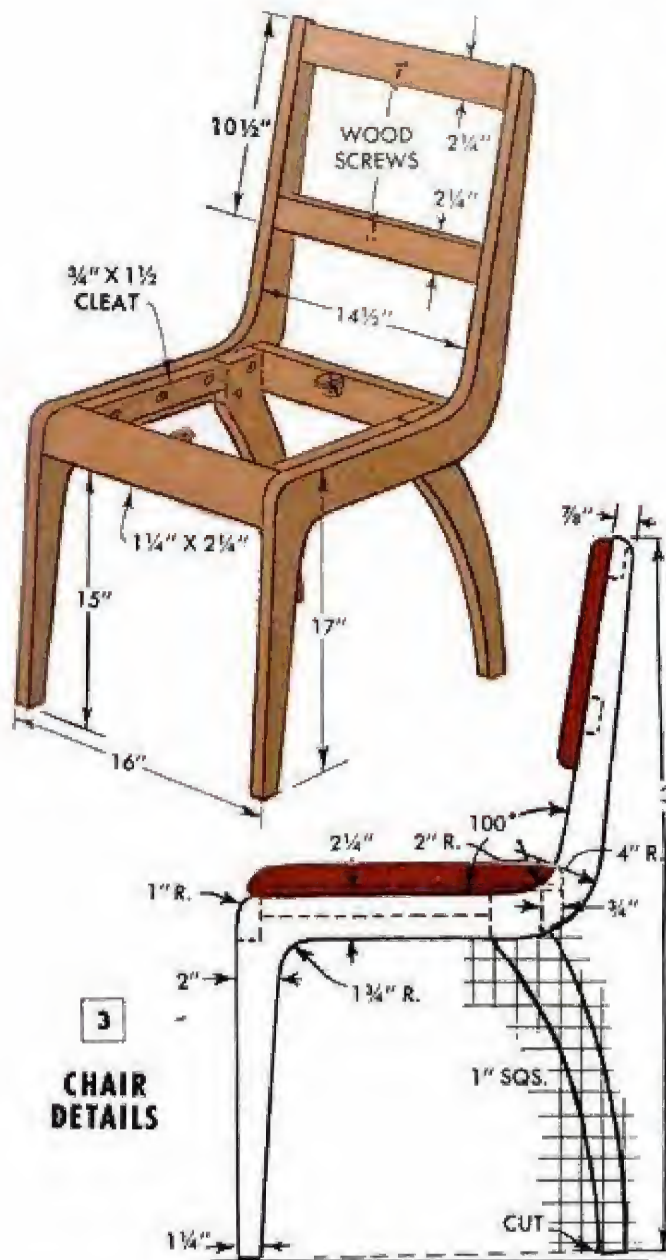




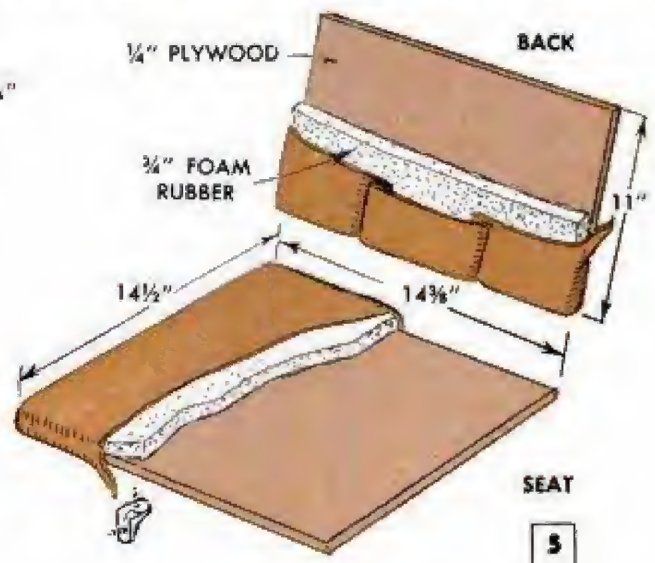


pieces A and B. Except in the case of the legs for chairs and table, regular $\frac{3}{4}$ -in., seven-ply plywood will do for these pieces. If you have no way of running the grooves for the rabbeted ends of the sidepieces, you can merely glue, butt and nail the joints, using screws at the bottom. You'll note in the case of the lower unit that the sides are set in $\frac{1}{4}$ in., where as in the upper unit the sides are flush. Three drawer frames are made exactly alike as detailed, and are fastened in place, properly spaced, with glue and screws. The length of the frames allows the drawers to come flush with the front edges of the cabinet. The back is enclosed with a panel of $\frac{1}{4}$ -in. plywood. Here again, cleats may be substituted for the rabbeted edges.

The U-shaped legs are laid out and cut from $\frac{3}{4}$ -in. plywood. After joining the ends to stretchers, the legs are glued and screwed to the base frame. In making the drawers, note that the front of each one is kept flush with the sides at the top but overhangs at the bottom an amount equal to the thickness of the drawer



End and side rails of the table underframing are mitered to 35 and 55 deg. respectively to fit the half-lapped leg assembly which is held by corner blocks



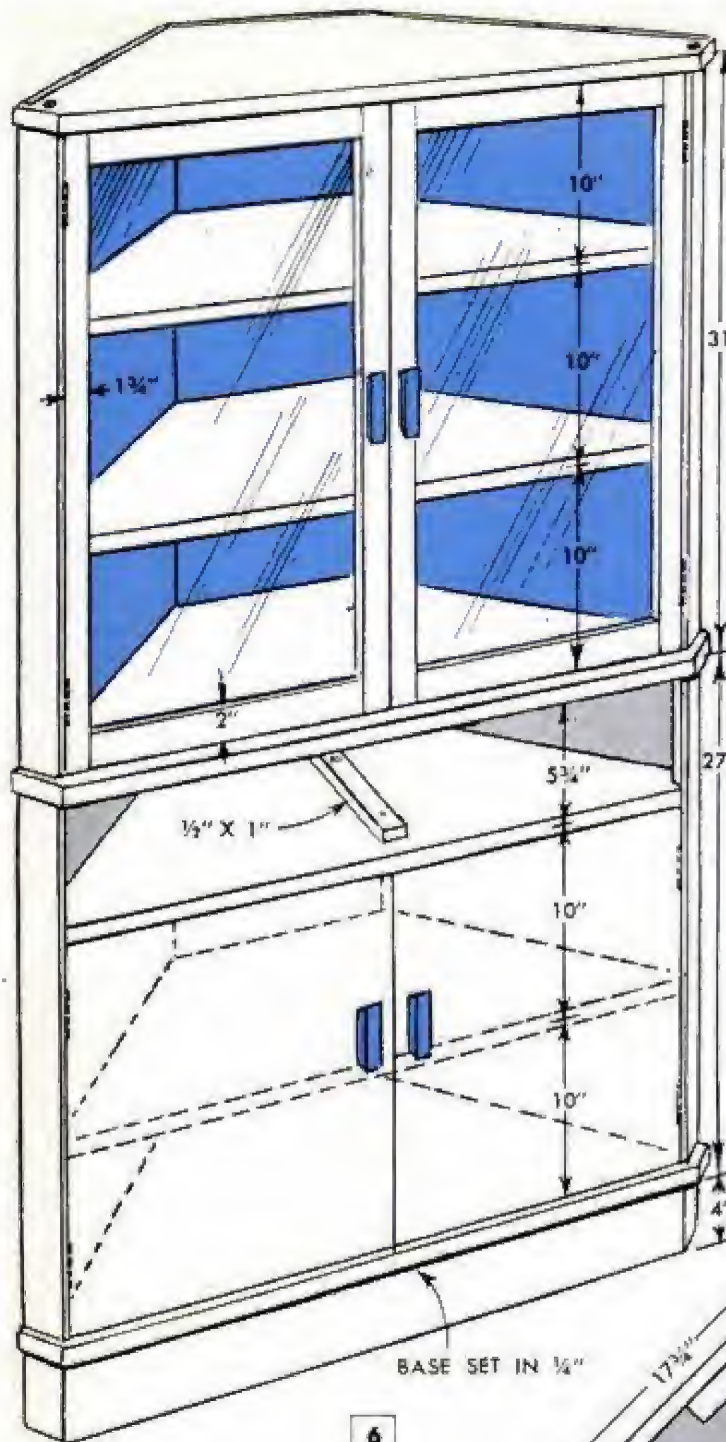
frame. The drawers are guided by a grooved runner glued to the underside of the drawer bottom. Two small drawers for silverware are fitted in the left-hand compartment. These ride on L-shaped runners glued and bradded in place.

The separate china unit, which merely rests on top of the buffet, is of box construction. In addition to being narrower than the buffet, construction differs in the manner in which the glass doors are hinged. Where grooves are indicated to support the shelves, cleats may be substituted. Dowels are used at the corners of the doorframes, and if necessary, the glass may be held in place with strips of quarter round fitted on both sides of the glass.

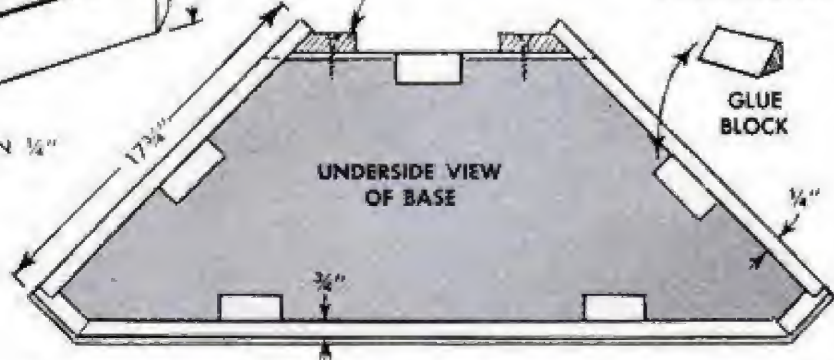
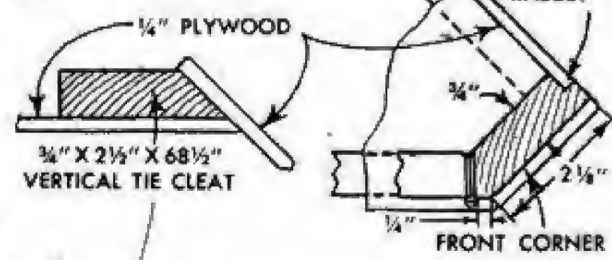
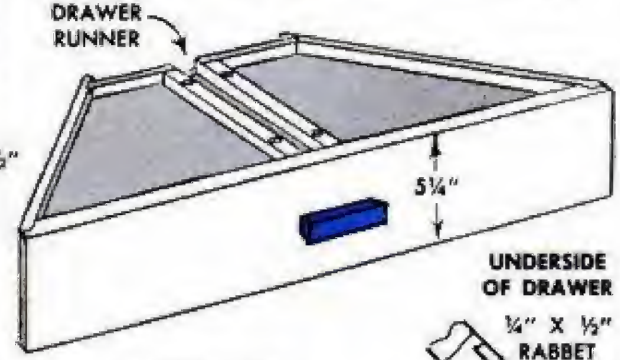
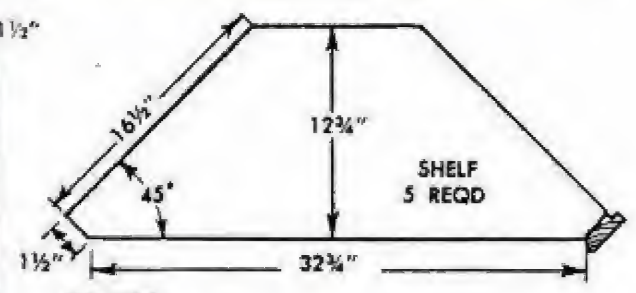
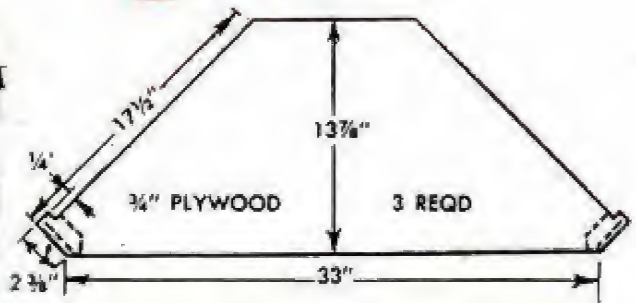
Extension table: Assembly of the table is clearly shown in Fig. 2. The half-lapped U-shaped members which form the understructure of the table are cut from lumbercore plywood and sawed out together so they will be alike. To economize on material, the legs are added separately with glue and dowels, the legs being cut from

waste from the U-shaped members. A miter box is used to cut the 35 and 55-deg. miters on the end and side rails. Note the side rails are grooved in the center for a crossmember to which the equalizer is attached. The rails are joined to the legs by driving screws through corner blocks, which first are glued and screwed to the rails. The underside view of the top shows how the table aprons are set 1/2 in. in from the edge, and how cleats are located on both top sections as well as the extra leaf to serve as guides in aligning the top on the table base. The equalizer is made of pieces of flat steel riveted at points indicated to act like a lazy tong. The two sections of the table top are fastened only to each end of the equalizer.

Chair construction: Lay out the pattern for the continuous leg and back of the chairs on lumbercore plywood, following Fig. 3, and saw several units at one time. Cut the rear legs in same manner. Join the legs at the front with a 1 1/4-in. solid member, rounded at the top corner, by gluing and nailing them, and setting the nails.



CORNER CHINA CABINET



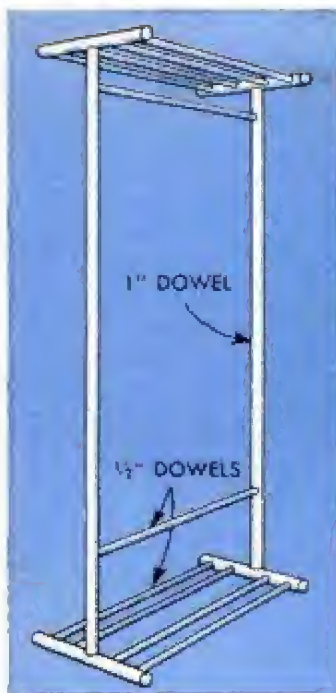
The back stretchers are then installed in the same manner and a cleat is fitted at each side for additional strength. Small angle brackets placed at the front and back rails are used to attach the seat, while the back cushion is fastened in place by driving screws through the two back rails, Fig. 6. Fig. 5 shows how the cushions are made and how the upholstery on the back cushion is divided equally with two folds before drawing it around the edge and tacking to the back. The raw edges of the material on the back are covered with a separate piece, hemmed around the edge and neatly tacked with blued gimp nails.

Corner china cabinet: This cabinet also is

made in two separate units which are held together with two long cleats screwed to both units at the back. Start by cutting out the shelves, making three of one and five of the other. The sectional view at the front corner shows how posts are fitted and screwed to the top and bottom shelf members. Plywood, 1/4 in. thick, is used to enclose the sides and back of both units and then the shelves are installed and nailed from the outside. A 4-in. base is added to the lower unit and attached with glue blocks as indicated in the underside view. Both the solid and glass doors are hinged in an identical manner to the front posts and finally the triangular drawer is added.

Designed especially to fulfill Lilliputian wardrobe requirements, this clothes rack will encourage tiny tots to hang their clothing and put away hats and shoes in an orderly manner. The rack, which is constructed entirely from lengths of dowel, is 2 ft. wide and stands head high to the child. Cut from 1-in. dowel, the uprights and endpieces may be assembled with screws, dowel or half-lap joints. After sandpapering all the pieces, assemble them first to see if they fit properly. This done, take the rack apart and reassemble it, this time using glue. Now paint or lacquer it to complete the job.

Miniature Clothes Rack Constructed From Dowels Teaches Small Children Orderliness



Typewriter Ribbon Taped to Paper Used in Tracing Border Designs

Taped along both edges to drawing paper or various textiles, discarded typewriter ribbons may be used for tracing border designs, provided that they are no wider than the ribbon. Unlike carbon or other tracing papers, the ribbon will withstand considerable pressure applied directly from

a pen or pencil without being punctured. For this reason, use of the ribbon offers the possibility of a number of design effects, obtainable mainly through the application of varying pressures on the tracing implement. The ribbon may be kept on the spool and any length desired cut off as needed.

Protecting Heads of Rivets While Peening Them

When installing new rivets or tightening old ones in kitchen utensils, tools and other articles, the rounded heads can be protected while being hammered by resting them on a sheet of soft aluminum, copper or lead which, in turn, is supported by a steel block or an anvil. If round rivet heads are backed by hard metal, such as steel, they will be flattened or otherwise marred.



Lubricating an Electric Clock

An excessively noisy electric-clock motor usually indicates a lack of oil, which can be applied to most motors without opening the case. To do this turn the motor so that the exposed pinion is at the top and, while warming it with the heat of a 60-watt bulb, apply a few drops of light household oil to the pinion. During the operation small bubbles will appear. As soon as the bubbling ceases remove the heat but continue to apply oil that will be drawn in around the pinion as the water cools.

Herman J. Hoffmann, Dakota City, Iowa.

Bumper Jacks Placed Under Trailer Provide Support While Parked

One trailer owner found that four bumper jacks, placed under the corners of a trailer, eliminate practically all sway and movement while the vehicle is parked. The jacks are of the double-expanding ratchet type and may be raised or lowered sufficiently for this operation without requiring the use of jack handles.

Clinton R. Hull, Costa Mesa, Calif.



While the biscuits are shown in a pan for convenience in handling, food can be placed directly on the shelf

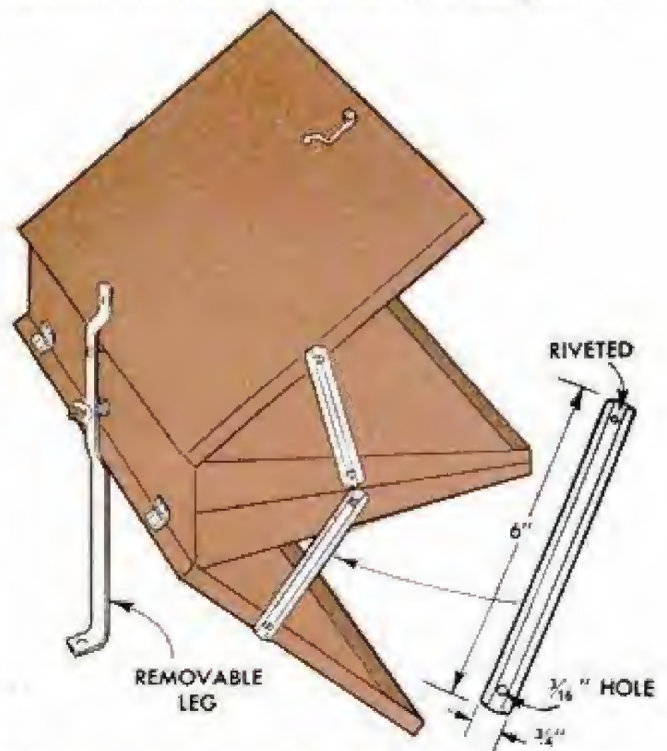
REFLECTING CAMP OVEN

By Walter E. Burton

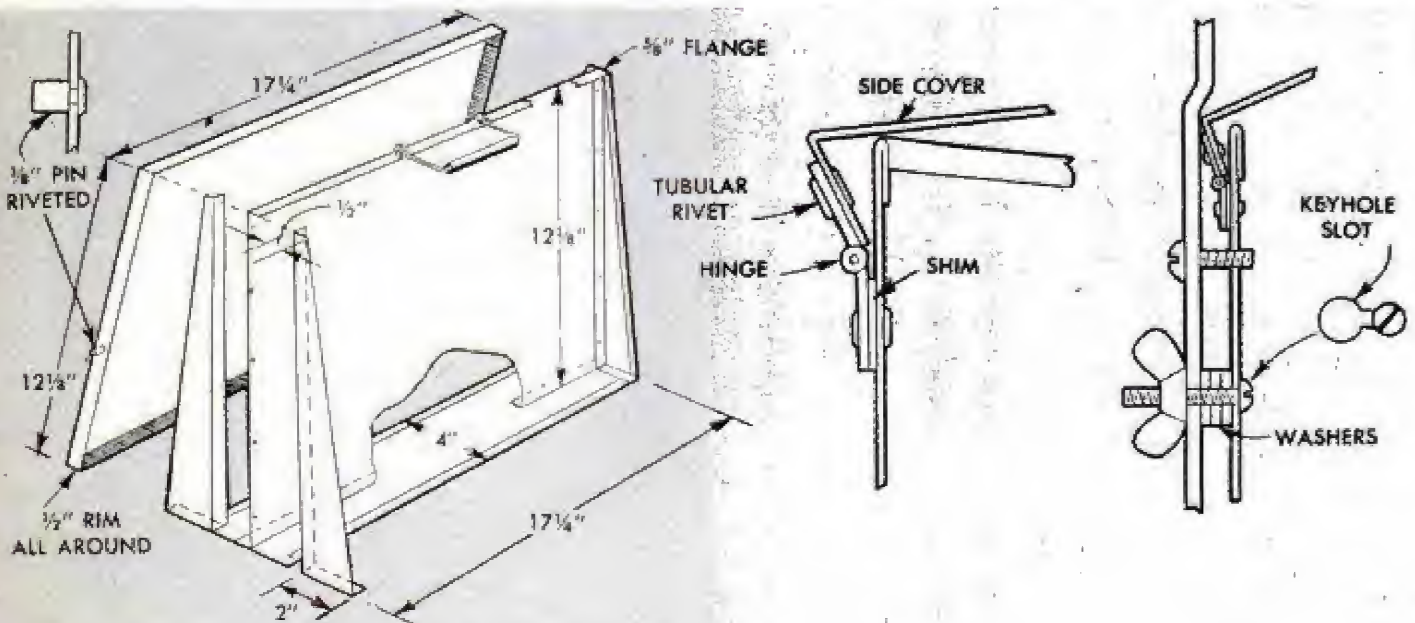
LIKE ANY reflector-type oven, this one is designed to be placed in front of an open fire where two inclined covers reflect heat waves against a center shelf on which food is placed. While the oven itself can be made of almost any sheet metal, the two reflecting surfaces should be of bright metal, such as polished aluminum or tinned sheet metal. Although not as good, bright galvanized iron will do for the reflecting surfaces. To help hasten heat absorption, it sometimes is helpful to blacken the underside of the center shelf with shoe polish.



Folded, the oven resembles a neat, metal brief case. Pivoted arms fold flush with sides of oven proper



This rear view of oven shows supporting leg and arms which snap in place to hold reflecting covers open





Cooking accessories, such as hamburger grill, fork and toaster, plus oven leg, all store inside the oven



The latch is formed of stiff wire, each part being attached to respective covers with sheet-metal screws



Leg which supports oven is made removable by means of horizontal keyhole slot which disengages screw



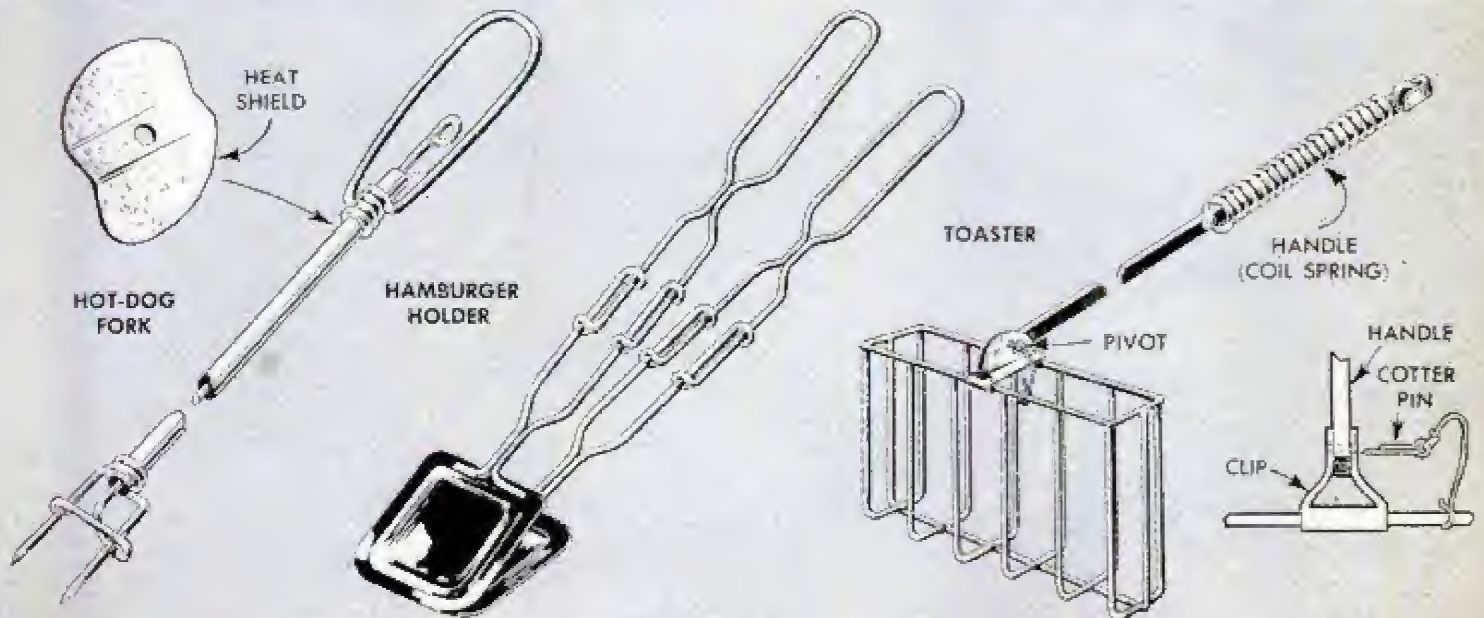
Commercial hamburger grill is used and the handles shortened so that unit can be stored inside the oven



The basket-type toaster holds two slices. Cotter pin in pivoted handle permits removal for storing



Toaster handle is fitted with "cool" grip formed by riveting coil spring to looped end of flat steel rod

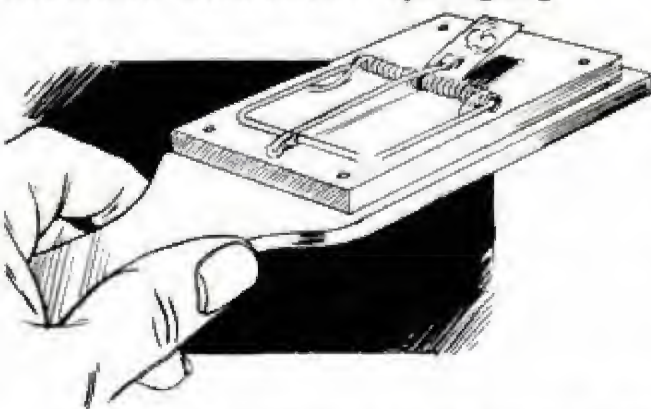




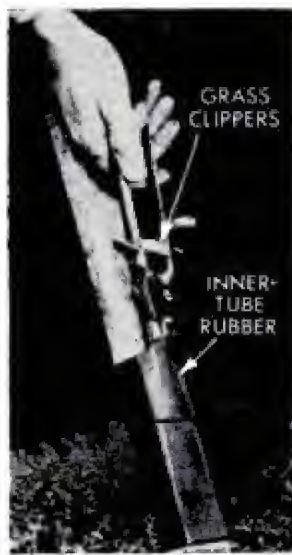
Handy Lawn-Mower "Holster" Carries Grass Clippers

Fastened to the handle of your lawn mower, this handy "holster" will keep your grass clippers close at hand for ready use whenever you are mowing a lawn. Cut from an old inner tube, a piece of rubber slightly longer than the clippers is wrapped around the mower handle and tacked in place at the lower end. The upper end of the rubber is cut to form a tab for easy insertion of the clippers.

Mousetrap Fitted With Handle Prevents Accidental Springing



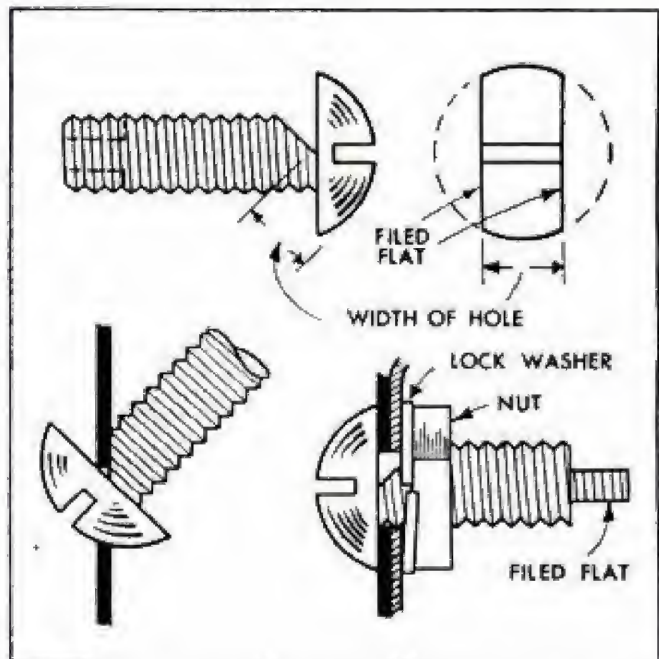
Placing a mousetrap after it has been set is a touchy job most people, especially women, dislike because of the fear of accidentally springing it. This fear is overcome to some extent by fitting the trap with a



long handle in the form of a wooden paddle. The long handle makes it much more convenient to place the trap under a bed or low dresser, and also to retrieve it. In addition to adding the handle, a length of string can be tied to the wire jaw so that the trap may be emptied without actually touching it.

Attaching Object to Thin Metal When One Side Is Accessible

This specially prepared screw will enable you to attach an object to a sheet-metal surface where only one side is accessible. Obtain a round-headed screw which is approximately $\frac{1}{2}$ in. longer than the total depth of the thicknesses through which it must pass,



and which has the same diameter as the hole to be drilled. Use a small triangular-shaped file to notch halfway through the screw just behind the head. Now file the head of the screw flat on two sides as shown. In the same manner, file the end of the screw shank flat, to provide a grip for the pliers when tightening. Insert the screw in the hole and mount the piece to be attached, followed by a locknut. Grip the end of the screw with the pliers and tighten.

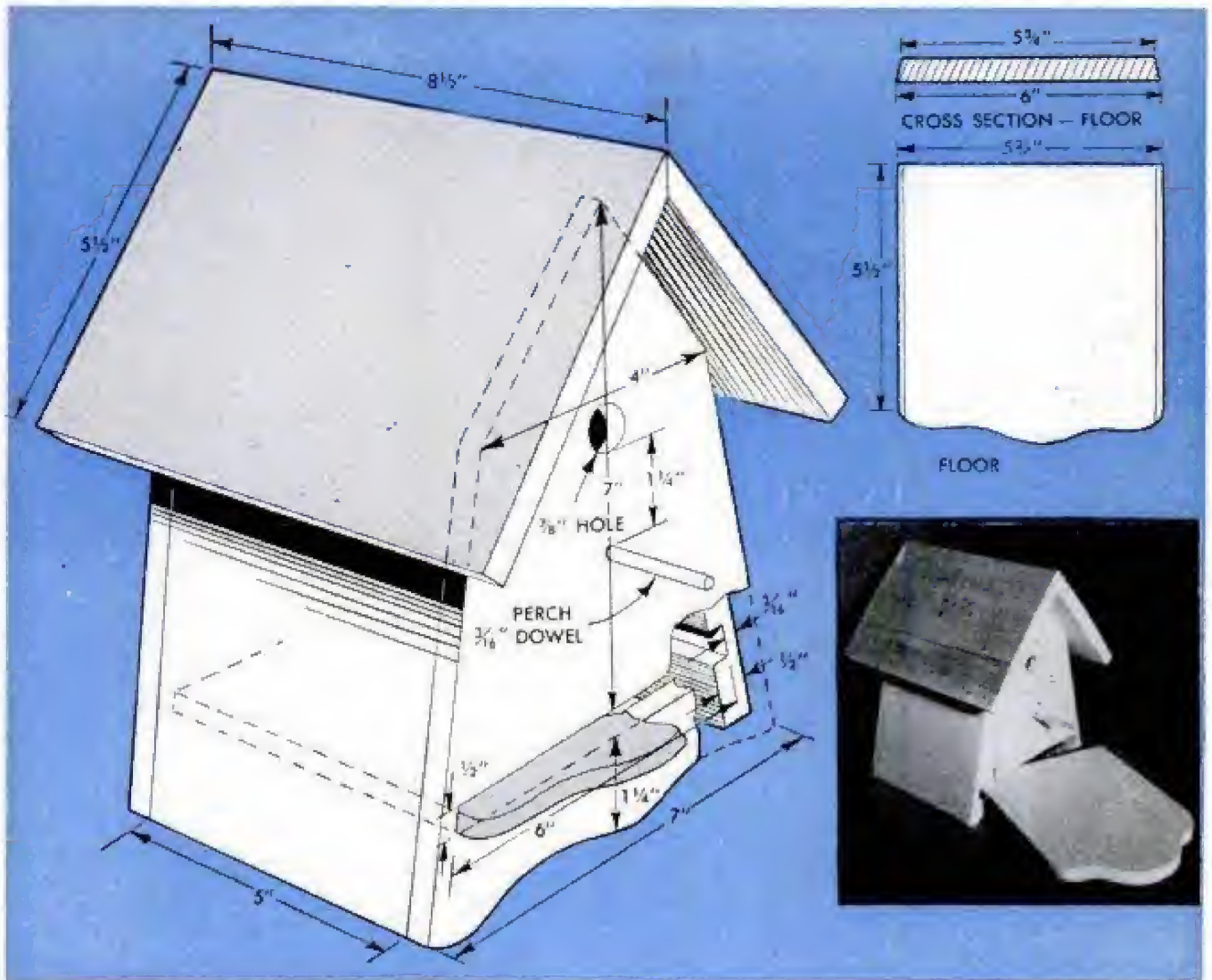
Ronald Tevonian, Forest Hills, N. Y.

Inexpensive Serving Trays From Cookie Sheets

Colorful serving trays may be made at little cost from large baking sheets of the type used for cookies. These are available at the dime store and are converted by painting them with enamel. If desired, decal transfers may be applied and the entire surface coated with clear shellac. Or, simply place a plastic serving mat in each tin.

Blanche Campbell, Las Vegas, Nev.

WREN HOUSE FEATURES PULL-OUT FLOOR



Differing primarily in its provision for cleaning, this little wren house, with its pull-out floor, is a natural sales item that will start the enterprising home craftsman in business. A few simple jigs to assure identical parts will permit quick mass production of the house. In addition, assembly time is lessened by not having a bottom to nail in place. Dowel perch may be omitted, as the projecting floor serves as a built-in ledge

Burs in Dog's Hair Removed Easily When Softened With Light Oil



To spare both you and your dog the ordeal of removing burs that have become entangled in his hair, try this simple stunt of softening them by applying a few drops of a light machine oil or hair oil. This will enable you to comb the burs out easily without causing the dog discomfort.

Defrosters Dry Dirty Car Windshield To Facilitate Cleaning

By turning on the defrosters fully, you can quickly dry any muddy water that has splashed on a car windshield, after which it can be wiped off with a cloth. This will prevent smearing the dirt on the windshield, as it will if you attempt to remove it with the windshield wipers or by wiping it with a cloth when wet.

Jack Probst, Royal Oak, Mich.

Solving HOME



SERVING CUSTARDS or gelatine desserts on a picnic is simplified by using ordinary ice-cream cones as containers. The cones not only cut down the number of dishes necessary to carry along, but also prove especially appealing to the children

● **RAISINS** added to a cake batter usually sink to the bottom instead of remaining evenly distributed. To prevent this, dip the raisins in melted butter and sprinkle with flour before stirring them into the batter

● **YOUR VACUUM CLEANER** will do a quick, neat job of removing dust and grime from the back of the refrigerator and its motor compartment. Turn off refrigerator and then vacuum with the long furniture attachment

● **RAW POTATO** removes stubborn iodine stains from linoleum. Cut a slice from the potato and place it over the stain. Allow the potato to remain on the stain until all traces of the chemical have been absorbed

● **VENETIAN-BLIND CORDS** will last longer if they are rubbed thoroughly with beeswax. This affords smoother operation and prevents abrasion when cords scrape edges of slats. Renew beeswax after cleaning cords

● **PINT MILK BOTTLE** fitted with spray head forms handy clothes sprinkler. Cork is selected to suit neck of bottle and is drilled through the center for head from garden sprinkler. Head should be wedged in cork



REMOVING PAPER stuck to polished furniture is done without marring the finish by dabbing the paper with cooking oil and rubbing briskly with a cloth. Paper then can be peeled off readily



CORRUGATED CARDBOARD provides a convenient holder for storing and carrying crochet hooks. Hooks are inserted in corrugations and holder is left flat for storing or rolled and bound with a rubber band

PROBLEMS

SO YOU WON'T BE LOCKED OUT by the screen-door hook accidentally dropping into the eye when the door is slammed, simply fasten the hook to the doorstep or casing and the screw eye to the door frame itself

TO KEEP RUGS and carpets looking new sweep them once a month with a broom dipped in hot water to which a little turpentine has been added. This also helps protect the rugs from damage by moths

WOODEN CLOTHESPIN serves as emergency doorstep. Place clothespin on edge and press down on its upper arm while sliding pin under door. Tension of arms usually is sufficient to hold the door securely in place

WATER SCALE is removed from graniteware or enameled kettle by boiling out with solution of 1 qt. water, 1 tbs. salt and juice of 1 lemon. Add 1 tsp. vinegar to hot solution, boil from 20 to 30 min., wash and dry

LINING COPPER PLANTERS and flowerpots with aluminum foil eliminates possibility of plant being killed by copper corrosion. Edge of the foil can be tucked inside rim of the planter so the foil is not noticeable



LARGE FUNNEL is just the thing for applying fertilizer to individual plants. By holding the funnel as pictured and covering the spout with the fingertip, the fertilizer can be dispensed exactly where needed and the amount can be controlled easily



USE STEEL WOOL to quickly reduce the diameter of a candle so it will fit holder. Wrap the steel wool around base of candle and, holding wool tightly, turn the candle to remove wax evenly from all sides



WAX PAPER keeps screw-type lids from "freezing" on jars in which paint is stored. Wipe both cover and jar thread clean and put square of wax paper over the jar mouth just before replacing the cover

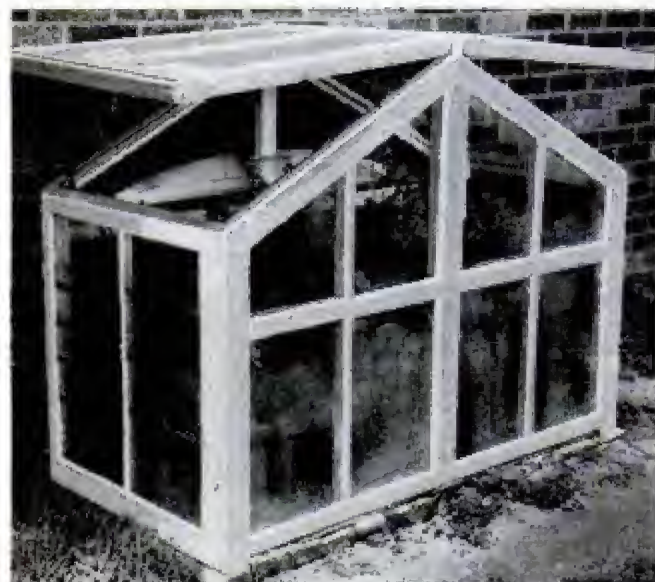
Wire Cradles Support Bottles Under Refrigerator Shelves



Suspended from shelves of a home refrigerator, pieces of coat-hanger wire bent to form cradles as shown will provide useful out-of-the-way storage for bottled beverages. The bottles can be slipped in or out of the cradles easily and utilize space that ordinarily is wasted.

Bess Ritter, New York City.

Miniature Hothouse Is Heated By Air From Basement



Supported on a brick foundation in front of a basement window, this small hothouse uses heat from the basement to maintain an inside temperature suitable for growing plants. A thermostat inside the house controls a fan which blows in warm air when the outside temperature drops below freezing. In cold climates it may be necessary to bring air directly from the furnace to

the hothouse. Assemble the hothouse from window sash, hinging the two sash that form the roof to provide ventilation on warm days. All joints should be sealed against entrance of cold air. Cleats may be fastened to the frames inside the end sash if desired, to support narrow shelves for holding small flower pots.

Grover Brinkman, Okawville, Ill.

Paper Plate Catches Paint Drippings

When painting directly from a can or improvised container, an ordinary paper plate placed under the container will effectively catch paint that overflows the rim and drips from the brush. The plate will also serve as a convenient resting place for the brush when not in use.



"Splints" for Misshapen Brushes

When the bristles of a paintbrush become misshapen because of improper handling or storage, they usually can be returned to their original shape by use of cardboard "splints." After the brush has been cleaned, ready for storage, cut a piece of cardboard equal to the width of the bristles and a little longer than twice their length. Carefully shape the bristles, fold the cardboard over them as indicated, and bind it with three or four rubber bands. After a period in storage the bristles usually will regain their original shape.—Ken Murray, Colon, Mich.



Paraffin Rustproofs Zippers

To keep new zippers from becoming rusty and difficult to work, rub them with a block of paraffin or a wax candle. Occasionally coat the zippers with the paraffin or wax as this will lubricate them as well as retard rust.

Blanche Campbell, Las Vegas, Nev.

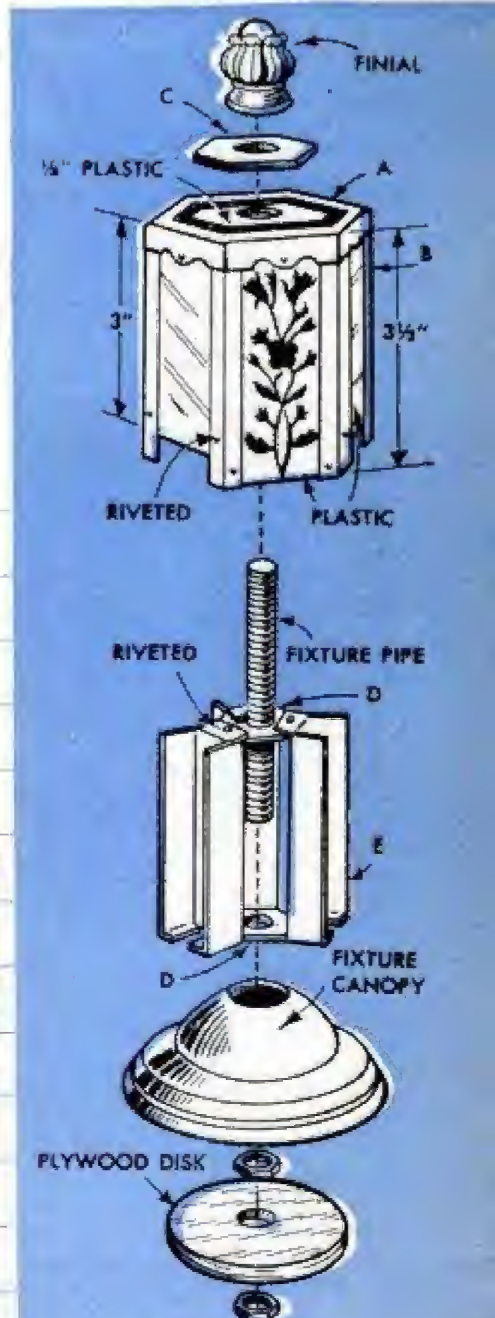
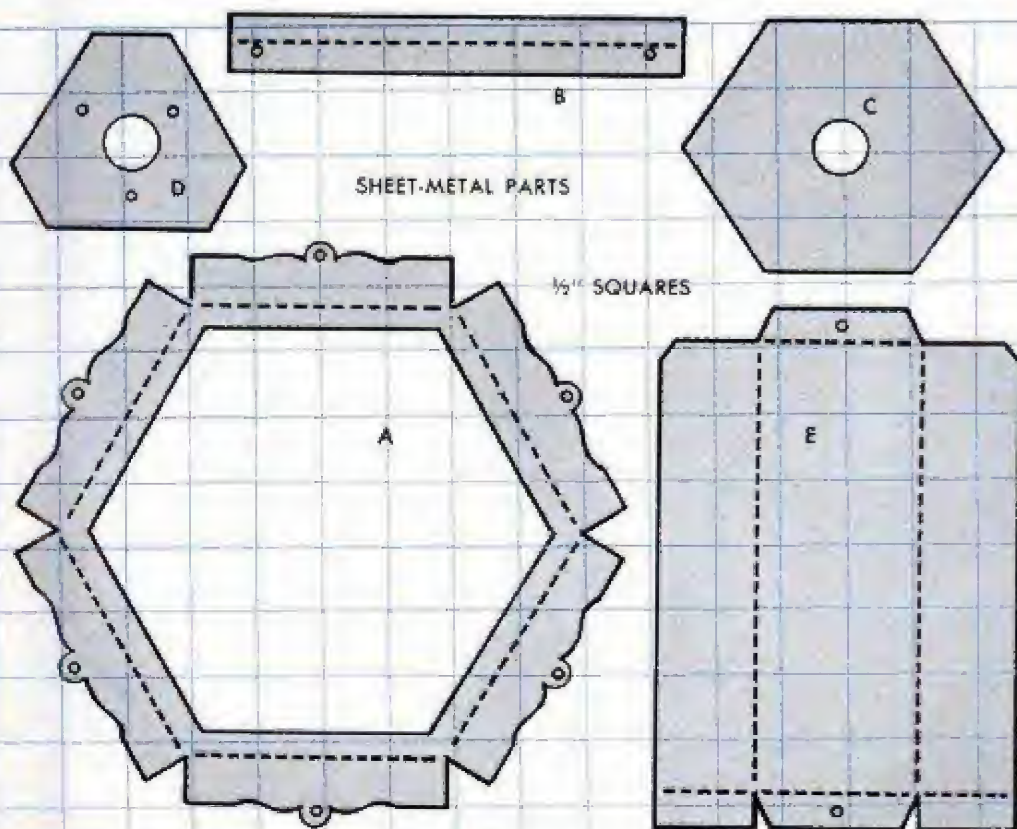
☐ Bottle corks which have become undersized due to long usage can be brought back to normal size by boiling in water in a covered pan.



LOAF-SUGAR DISPENSER

By Charles and Bertram Brownold

PATTERNED after a glass antique, this attractive sugar dispenser holds three stacks of sugar loaves so that the bottom loaf can be removed from each stack with the finger tip. The parts, shown in the pattern below, are cut from any workable sheet metal of a gauge heavy enough to hold its shape. The sugar channels, part E, are bent in a simple wooden form and are riveted to two endpieces, part D. Side panels and top are cut from clear plastic and riveted to frame, A, and six corner members, B.





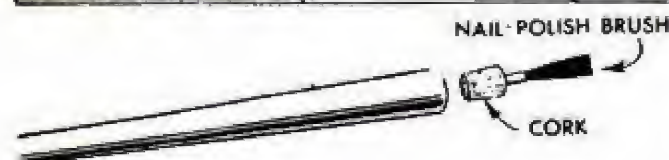
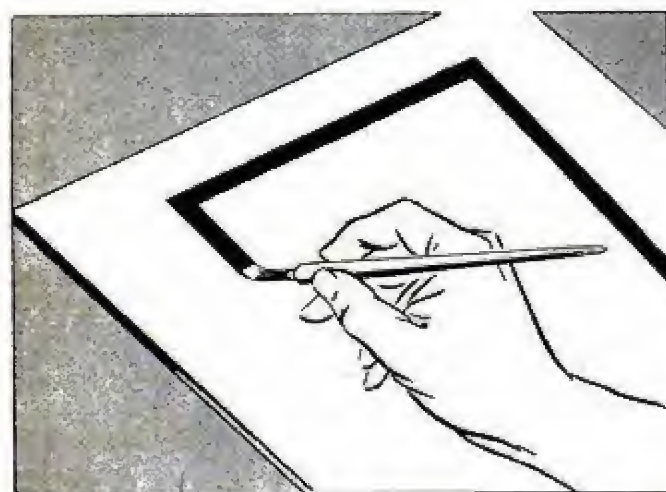
Caster Cup Used as Coin Tray At Refreshment Booth

Noting the difficulty experienced by customers in picking up change from the tables or counters of bazaar booths, especially when one or more coins might roll onto the floor, one lady provided each booth with a large castor cup. These permitted the change to be deposited without spilling or rolling and allowed the customer to gather it up with a single motion of his hand.

G. E. Hendrickson, Argyle, Wis.

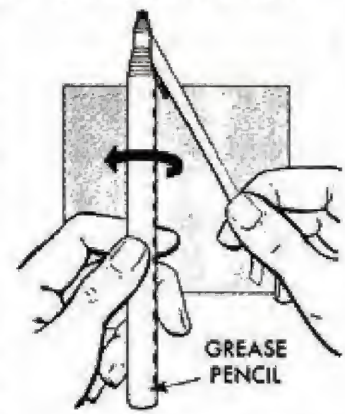
Nail-Polish Brush Can Be Used For Lettering and Line Work

A brush taken from a discarded nail-polish bottle and fitted into the handle of a penholder will provide a good drawing or lettering brush for producing lines up to $\frac{1}{8}$ in. wide. It may be necessary to fit the shank of the brush into the large end of a cork and ream the end of the penholder to take the cork, which is then wedged or cemented into place. The tip of the brush may be feathered to a point, if desired, for doing fine work.



Way to "Sharpen" Grease Pencils

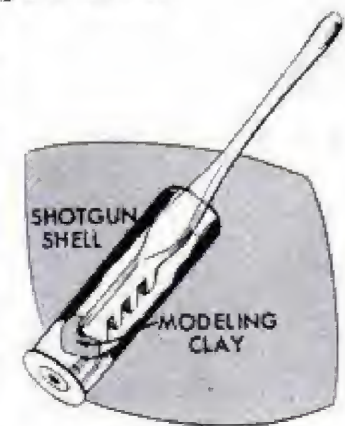
After the tab string is pulled back well beyond the first circle marking, a grease pencil may be "sharpened" more easily by unwinding the paper coil in an outward and downward direction. This action causes the paper coils of the pencil to separate cleanly on the scored line as the pencil is rotated.



Warren C. Riter, Rochester, N. Y.

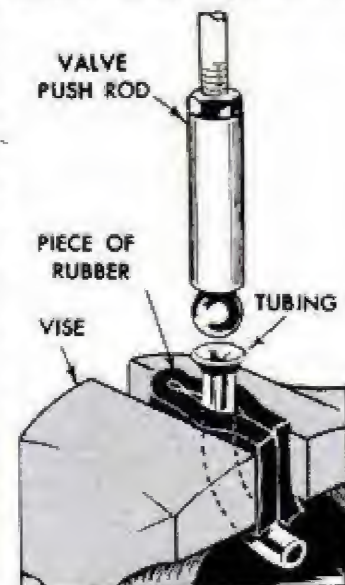
Glass Cutter Provided With Case Made From Shotgun Shell

To protect the sharp edge of a glass-cutter wheel from damage by other tools in a tool kit or drawer, store the cutter in a case made from a shotgun shell. Place a small portion of modeling clay or oil-soaked cotton in the bottom of the shell and, after the cutter has been placed in it, fold the top edge of the shell inward to hold the cutter in place.



Valve Push Rod Flares Tubing

Flaring of small-diameter metal tubing is done quickly and easily by using the ball end cut from a car-valve push rod. Cut the rod to a convenient length and mount the tubing in a bench vise, folding a piece of rubber around the tubing to cushion it from the vise jaws. Then place the ball end of the rod in the opening of the tubing and tap the rod with a hammer until the desired amount of flare is obtained. Be sure the tubing is secured near the end to be flared so that it will not buckle. — W. Shields, Bloomington, Ill.



PAINING HINTS

By
John Strickler

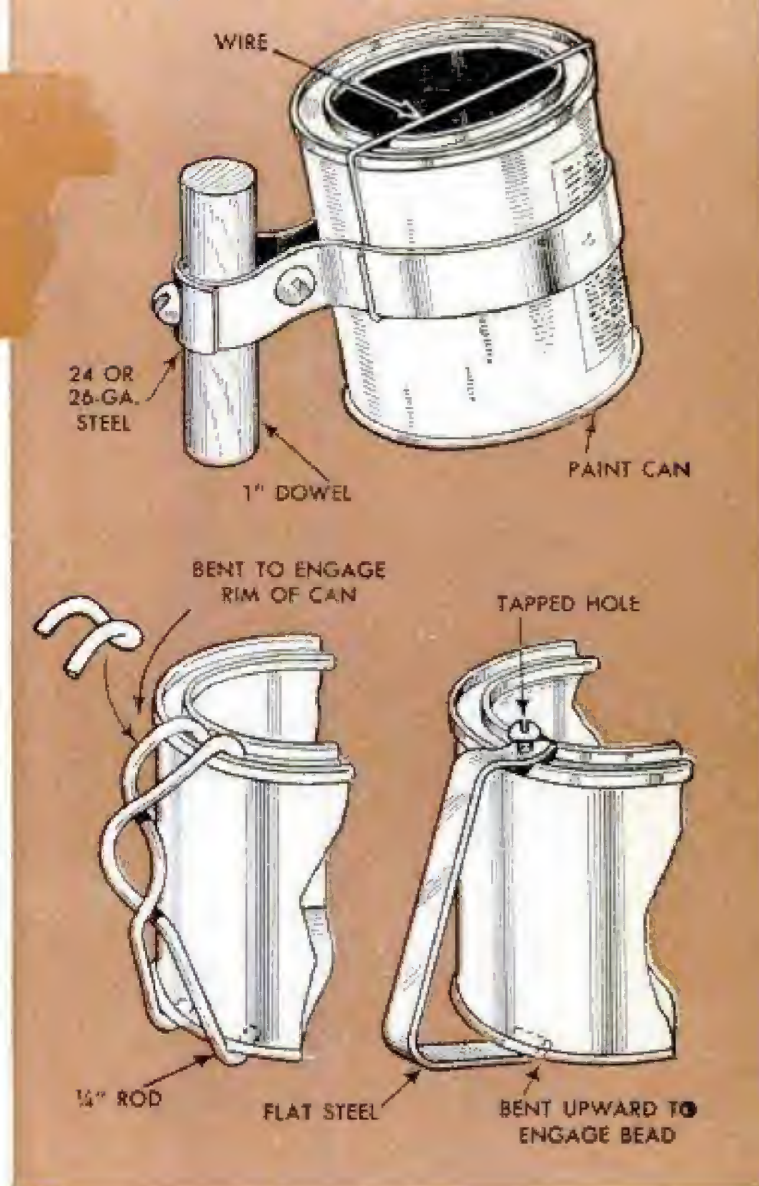
HOLDING a paint can without getting a handful of paint is no trick when you have one of the paint-can handles detailed at the right. Chances are that you have a piece of sheet metal, flat steel or a length of $\frac{1}{4}$ -in. rod on hand to make one of the three types of handles in just a few minutes. Note in the upper detail that a length of wire is stretched across the top of the can. With this, you can remove surplus paint from the brush without filling the rim channel of the can. The lower right-hand photo pictures a wooden paintbrush scraper that will cut your brush-cleaning time in half. Bevel one end of a piece of scrap wood to a chisel edge and, resting the brush on a flat surface, rub the bristles with the edge of the block. Start at the ferrule and work toward the ends of the bristles, forcing out excess paint which has accumulated in the center of the brush directly below the ferrule.

Paint-can handle of flat steel shown in use. Handle is bent to provide plenty of clearance for fingers



Long-Lasting Crack Filler Has Cornstarch Base

If you have tried using glazier's putty as a crack filler for a wooden floor and found that it would not adhere, make a filler by adding a mixture of linseed oil and turpentine, as well as a little drier, to ordinary cornstarch. After kneading the materials to a puttylike consistency, coat the



Hard-to-remove paint is pressed from brush with wooden block, as shown. Front edge of block beveled



cracks with linseed oil and press the substance into them with a putty knife. When hardened, sandpaper it to the level of the floor. If the floor is to be varnished, stain must be used to make the filler match the floor. Daub stain on the filler with a brush to obtain the desired color.

PLAN of the MONTH...



YACHT CHAIR

MATERIAL LIST

(Maple, Birch or Oak)

- Yacht chair**
 4 pcs.—1½" x 2½" x 27½"—Legs
 4 pcs.—1½" x 2½" x 19"—Side rails
 2 pcs.—1½" x 3" x 16"—Back posts
 2 pcs.—1½" x 2½" x 5¾"—Arm stumps
 2 pcs.—1½" x 2½" x 17½"—Arms
 1 pc.—10" x 25"—Back (canvas)
 1 pc.—15½" x 27"—Seat (canvas)
 1 pc.—1" x 16¾"—Dowel
 2 round-head wood screws, 3½-14
 6 oval-head wood screws, ¾-10, and cup washers
 4 butt hinges, 2" x 2"
- Steamer chair**
 2 pcs.—1½" x 6" x 45"—Sides
 2 pcs.—1½" x 2" x 39½"—Sides
 1 pc.—1" x 18"—Dowel
 1 pc.—¾" x 18"—Dowel
 1 pc.—1" x 20½"—Dowel
 1 pc.—¾" x 20½"—Dowel
 1 canvas sling, 1½ yd. x 15½" wide
 2 carriage bolts, ¾" x 3", with 4 washers
 1 hemp rope, ½" dia. x 6 ft. long

TOP VIEW



ARM DETAIL

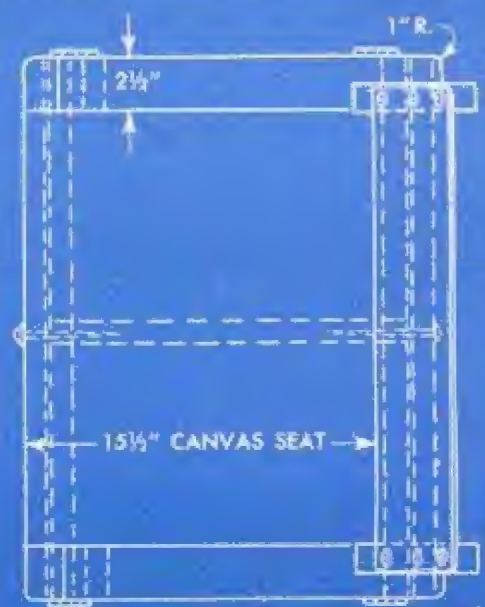
SIDE VIEW



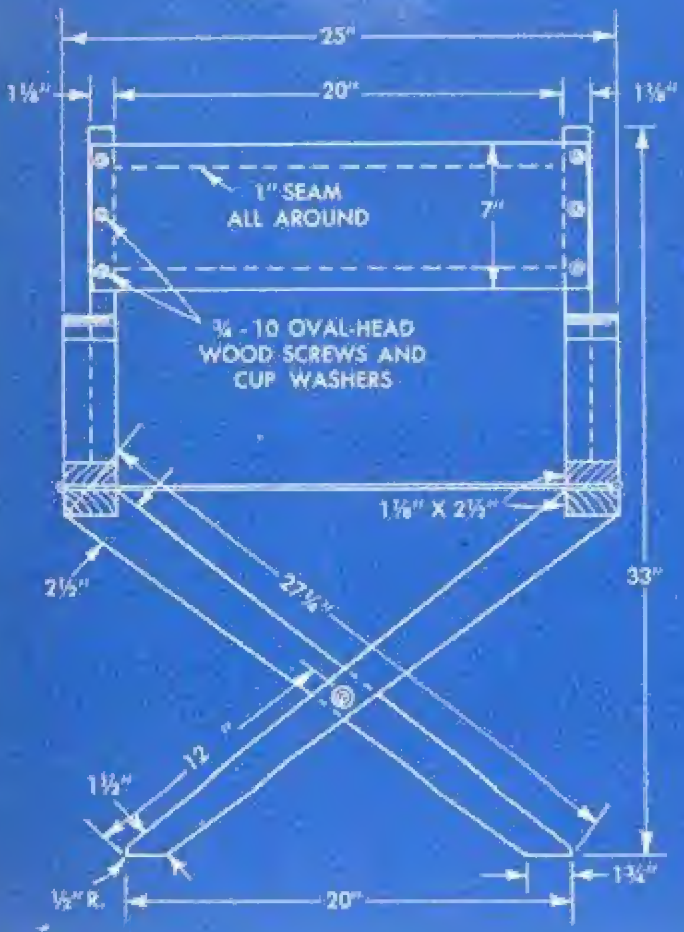
SEAT CANVAS



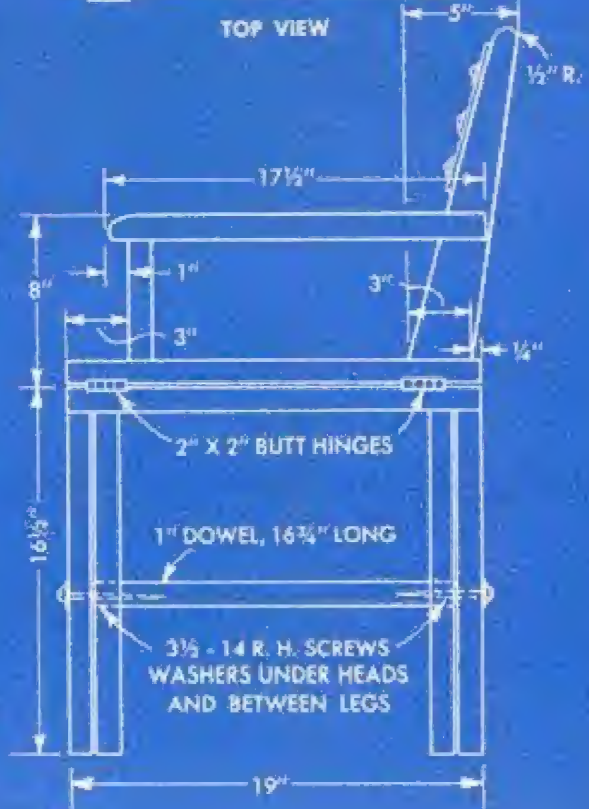
No. 4 CUT TACKS



TOP VIEW

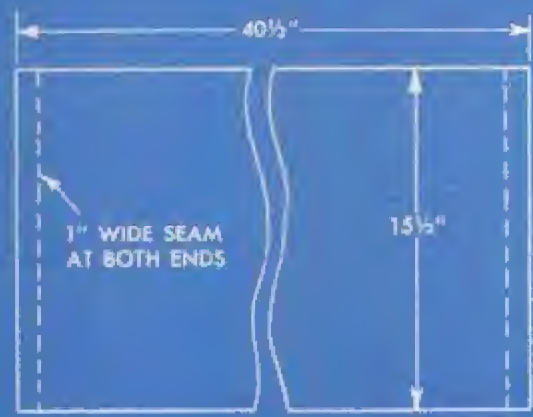


CHAIR IN FOLDED POSITION



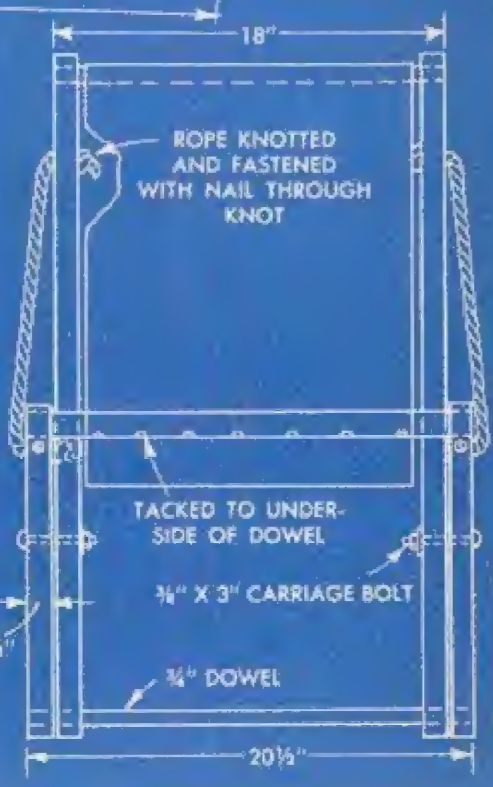
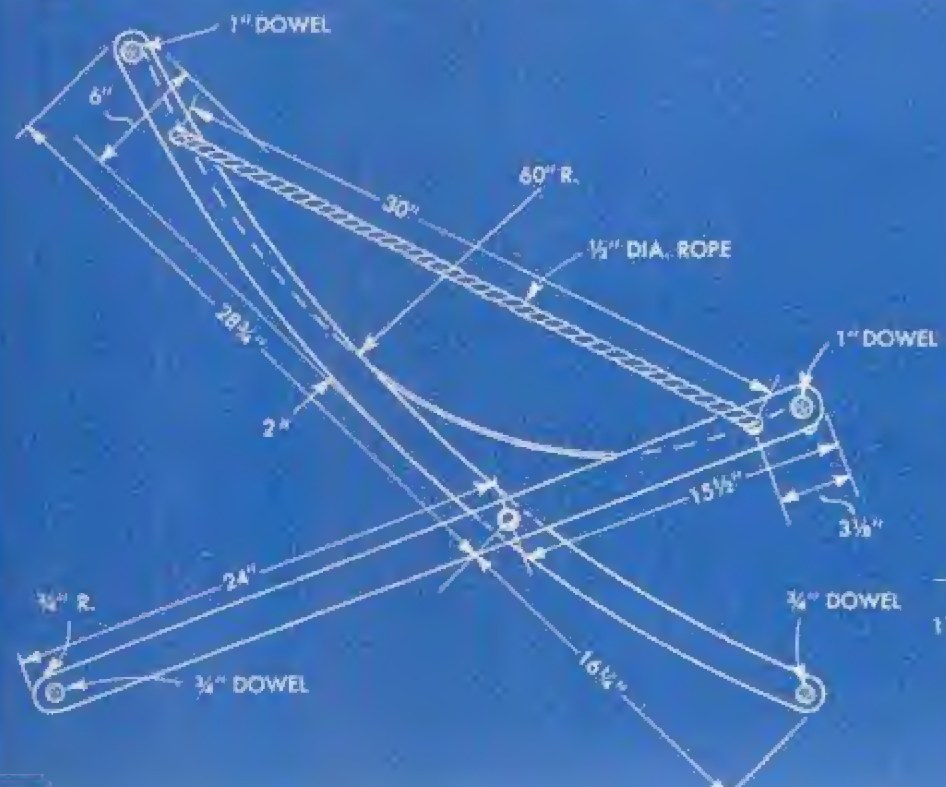
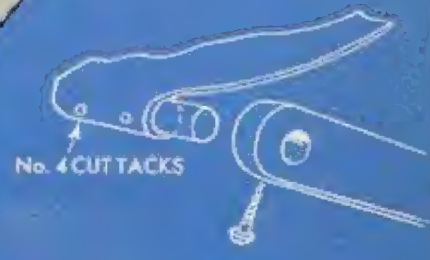
... Folding Porch Chairs

John Bergen, noted furniture designer, kept the small-home owner foremost in mind when he designed these two folding porch chairs. Not like the usual bulky type which always poses storage problem, these require the very minimum of space, as they fold so compactly that they can be tucked away in a closet if necessary. Easy to carry and stow in a car, either chair will appeal to those who like to picnic or spend a day at the beach. Oak, maple and birch are recommended woods to use. Both curved legs of the steamer chair should be bandsawed and drilled together. Select a heavy-weight duck material of good quality for the seats and backs of the chairs.



CANVAS SLING

STEAMER CHAIR



How to Cut Large Metal Sheets With a Hacksaw



If you are faced with the problem of cutting a large piece of sheet metal with a hacksaw, try this method. First, cut one slot as deep as the saw frame will permit. Then start another about an inch away from the first and turn back the resulting strip as shown. Repeat this procedure until the entire sheet has been cut through.

Hugh Lineback, Stillwater, Okla.

Removing Gasoline-Gauge Float From Car Fuel Tank

When it becomes necessary to remove the gas-gauge unit from the fuel tank, you will find it easier to cut an opening in the floor of the trunk to permit access to the unit than to remove the tank. By taking measurements from the underside of the car, the



location of the opening in the floor can be indicated. A hacksaw blade is used to make the cut so that a flap of the metal floor can be folded back. After the repair is made, the metal is folded back in place, after which a little undercoating or putty will seal the opening effectively. However, if desired, a metal plate may be bolted over the opening to close it.

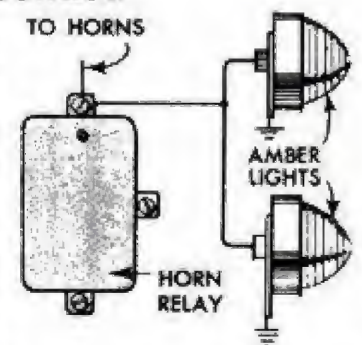
Improvised Money Belt

If you find yourself in a position where it is necessary to carry a large sum of money in currency you can do this temporarily, with reasonable safety, by folding some of the larger bills to a narrow width and taping them to the inside surface of your trouser belt. When doing this it is a good idea to wrap the folded bills with cellophane taken from a cigarette package, then attach them with cellulose tape to the inner surface of your belt. This should not be considered a permanent method of carrying money but it may provide you with a greater feeling of security in an emergency.



Caution Lights Operate on Car When Horn Is Sounded

In order to give the driver behind him warning of a possible stop, one motorist wired the amber caution lights on the rear of his car so that they would glow whenever the horn was sounded. As shown in the drawing, the lights are wired to the side of the horn relay leading to the horns themselves, providing current for the lights only during the time the horn button is depressed. The other side of the light circuit, of course, is grounded by attaching it to the frame of the car.



Fred Lettino, Astoria, L. I., N. Y.

Bottle-Cap Mailing Container

Taped together, two soft-drink-bottle caps form a compact mailing container for rings, loose stones and other pieces of jewelry. A large container may be made by joining together metal or plastic screw caps from jars and large bottles.

John J. Rea, Urbana, Ill.

RIDING TRAILER

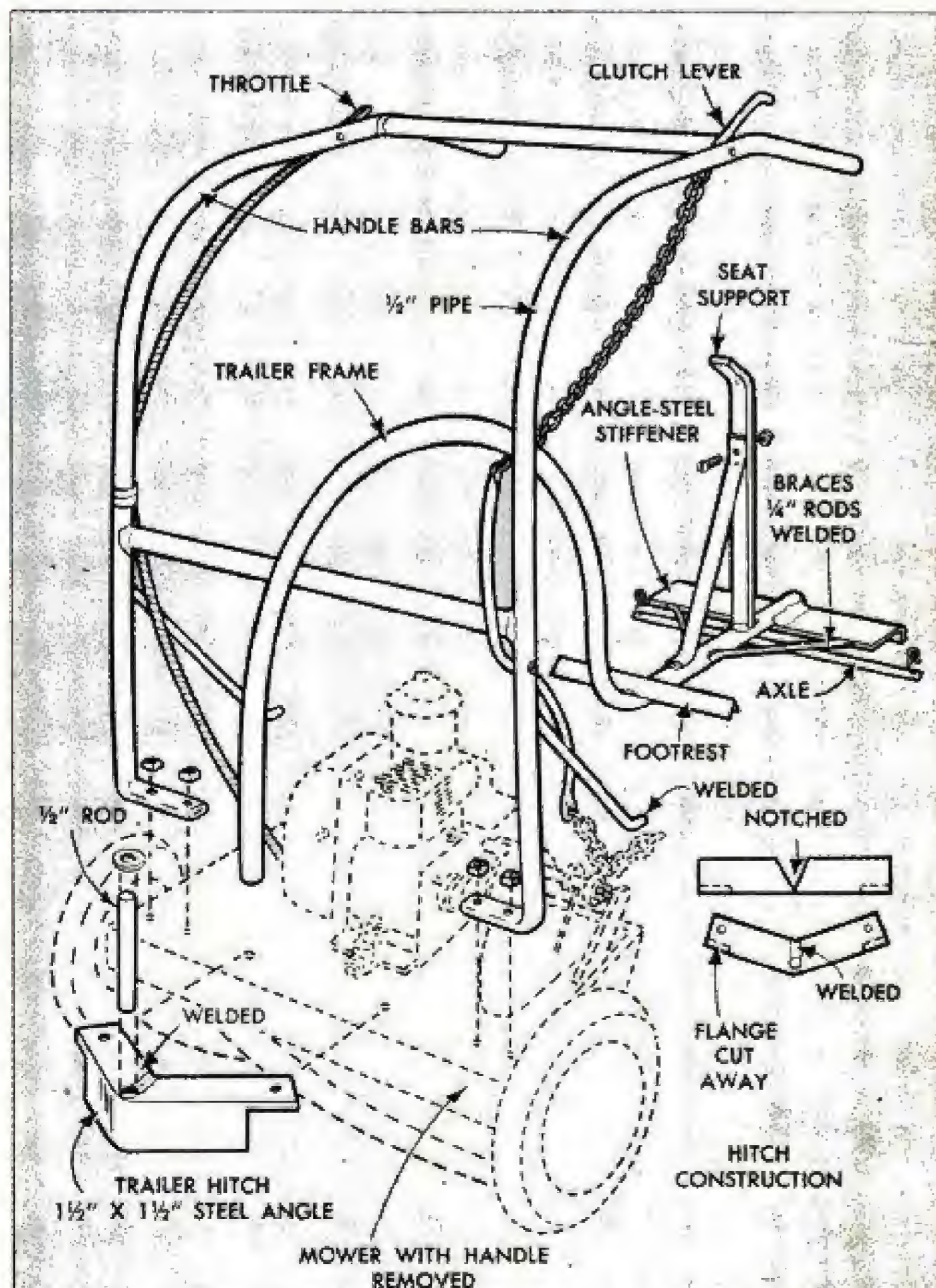
for power lawn mower

By Herbert P. Bryant

A BIG LAWN looks a lot smaller when you are comfortably seated on this power-mower trailer. Use of a riding trailer such as this one reduces grasscutting time as much as 20 percent since you can make faster, shorter turns and also speed up mowing above a normal walking pace on the straightaway. The trailer unit requires no alteration of the power mower other than removal of the regular handle and substitution of special handle bars and a trailer hitch.

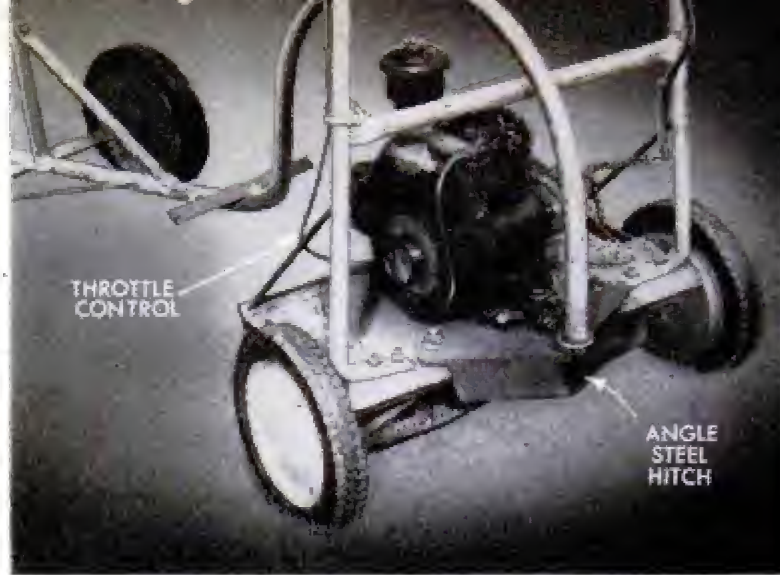
Dimensions given in the detail drawings of the trailer and handle bars on the following page are only approximate. They must be altered to suit different mowers. The detail at the right shows clearly the position of the trailer frame and handle bars in relation to the mower. An improvised extension of the clutch-control mechanism is located on the left handle bar and consists of a chain linkage which works through a bell crank attached to the handle bar below the cross brace. On some mowers the throttle may be utilized but on others an extension may be necessary.

Ordinary black pipe is used for the handle bars and braces. For the curved trailer frame extra-heavy pipe should be used as this unit is subjected to considerable bending stress. If you do not have facilities for making true-radius bends in pipe of the sizes required take the parts to your plumber. He can do the job at a nominal cost. Note that the lower ends of the

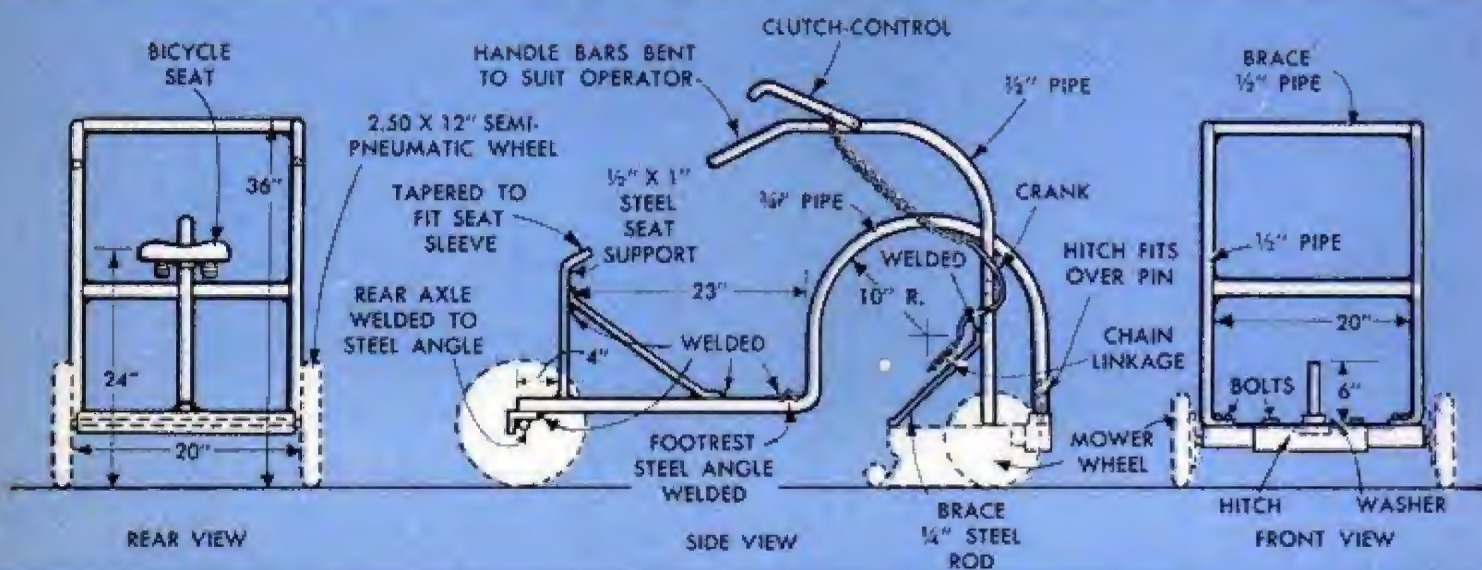




The lawn mower-trailer unit can be made to turn in its own length, an essential feature when mowing around flower beds and in irregularly shaped plots



This photo calls attention to the simplicity of the trailer hitch and manner of assembling the handle bars and controls. The regular mower handle is removed



handle bars are bent at right angles and flattened. Holes are drilled in the flattened ends for bolts which pass through holes drilled in the mower shield, or guard. This usually is of heavy sheet metal and will require no reinforcing. Handle-bar braces are welded in place as indicated.

The simple drawbar shown can be adapted to nearly all types of power mowers. It is made by V-notching a short length of steel angle so that it can be bent and the joint welded. Flanges at the ends are cut away to clear the mower guard and holes are drilled for bolts and a 1/2-in. steel rod, 5 in. long, which is welded to the drawbar angle in the vertical position and serves as a pivot for the front end of the trailer frame. It should be noted that the curve of the frame is stopped at a point about 8 in. from the end. The remainder of the pipe is straight so the parts can swivel freely without binding when it is placed over the pivot pin.

A short length of steel angle welded near

the center of the frame just below the bend serves as a footrest. At the rear end the frame is welded to an angle-steel stiffener which in turn is welded to the axle. The seat support is welded to the frame and braced as indicated. A bicycle-type saddle seat is used, and some filing may be necessary to fit it securely over the tapered projection of the support. Angle braces projecting to the rear support the handle bars and the lower ends of the braces are welded or bolted to the mower frame. The trailer wheels are 12 in. in diameter and are of the semi-pneumatic type having integral bearings. They are attached to the axle with cotter keys and washers.

Pruning Saw Carried Safely

When transporting or storing a pruning saw, the chances of being cut by the blade are less if it is reversed in the saw frame. The operation requires the removal of one wing nut.

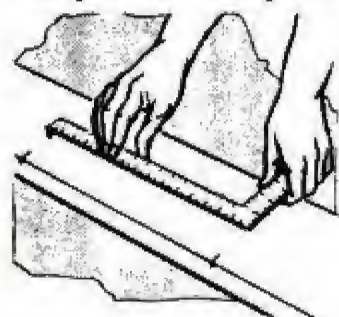
Lantern Anchored Safely In Bucket of Sand



Sinking the base of a lantern into a bucket of sand will provide a quick and effective means of preventing the lantern from being blown over in strong winds. An anchor improvised in this manner is ideal for night signal lanterns that are used

as warnings in instances where a sidewalk has been torn up for repairs or a hole has been dug for planting a tree.

Carpenter's Square Scribes Lumber

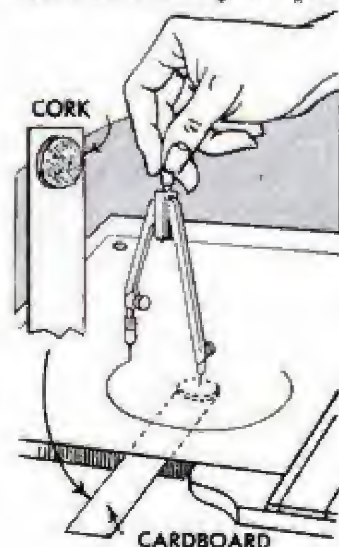


Rough lumber for concrete forms can be measured and marked in one operation if the work is scribed with a burr bent on the end of a carpenter's square. The square should be one that is no

longer suitable for ordinary use. Hammer down one corner at the end of the body section (the longer arm) to upset the metal and form a sharp burr. Then, with the square located on the work, simply press it against the surface and draw it across to mark the wood.

Cork Disk Under Compass Point Protects Unused Drawing Paper

When drawing on a pad of paper, or with extra sheets placed under the drawing, it isn't necessary to puncture several sheets



of paper each time you use the compass. This can be prevented simply by gluing a thin cork disk to the end of a strip of cardboard which is then slipped under the top sheet. Now, by means of the cardboard tab, position the cork disk directly under the spot where the compass point will be located.

Small-Parts Containers for Shop Made From Coconut Shells



Shells of coconuts that are opened by sawing them through the middle can be salvaged for use as small-parts containers in the shop. Face-off the bottoms of the shells to provide bearing surfaces and screw them onto a narrow shelf over the workbench, as illustrated. Or screw each shell to an individual base, if desired, so that it may be carried wherever needed.

H. Moetzing, Toronto, Ont., Can.

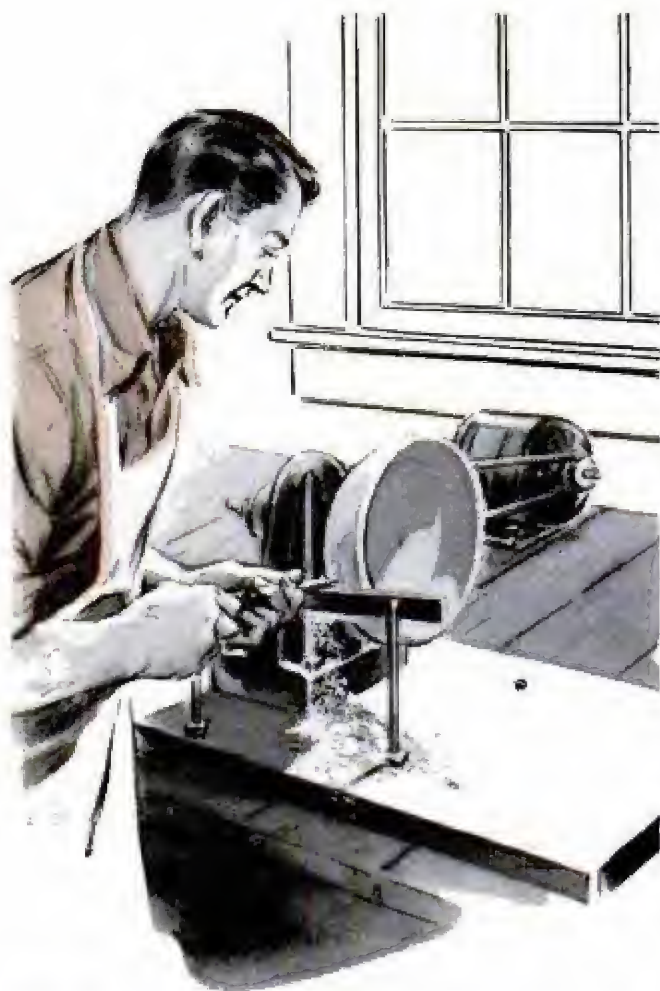
Small Hand Grinder Guided Easily



When using a small hand grinder for routing, grooving or slotting you will find it simpler to follow a given line by pressing the chuck ferrule against the edge of the wood as the tool is guided along. The cutter bit or saw may be set into the chuck at different depths to vary the distance between the bit and ferrule.

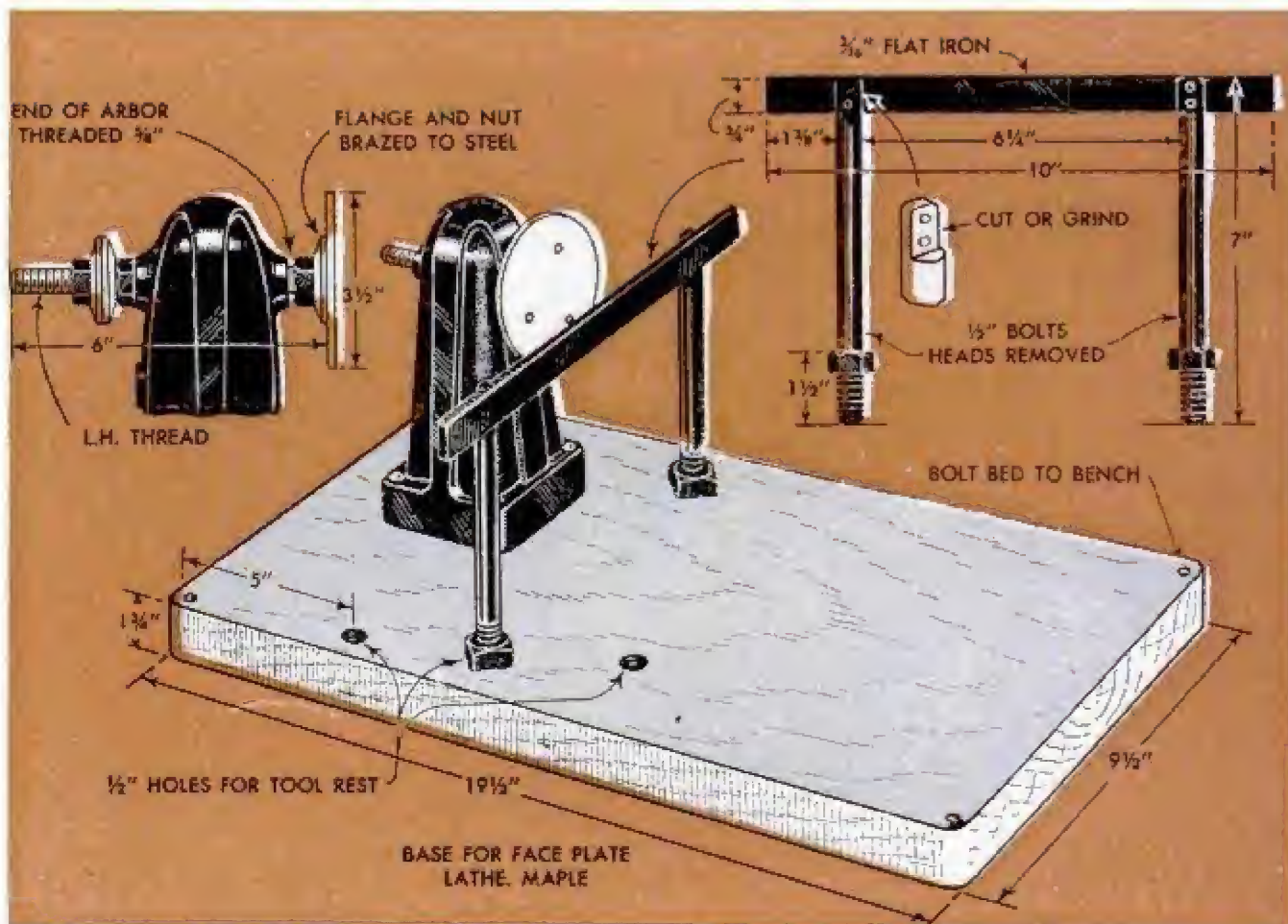
FACEPLATE LATHE From Polishing Head

By Dick Hutchinson



IF YOU ARE beginning a home workshop on a limited budget, the mere price of a polishing head will provide you with the basic part needed to make an excellent faceplate lathe, ideal for turning bowls, picture frames and trays. Fitted with a faceplate at one end and a grinding wheel at the other, you'll have a most convenient setup for sharpening your turning tools. Although a suitable faceplate can be purchased to fit the arbor of the polishing head, one can be made by centering and by brazing one of the arbor nuts and flanges to the blank cover of an outlet box. The faceplate end of the arbor is cut off so that it projects approximately $\frac{5}{8}$ in. to bring the mounted work close to the polishing-head bearing. The polishing head is bolted to a hardwood base, and a tool rest is made from two $\frac{1}{2}$ -in. bolts and a length of flat steel. The heads are removed from the bolts and flats are filed at the upper ends to provide seats for riveting the flat steel. The threaded ends of the bolts engage holes drilled in the base, the height of the rest being adjusted to bring its top edge about $\frac{1}{8}$ in. above the center line of the faceplate.

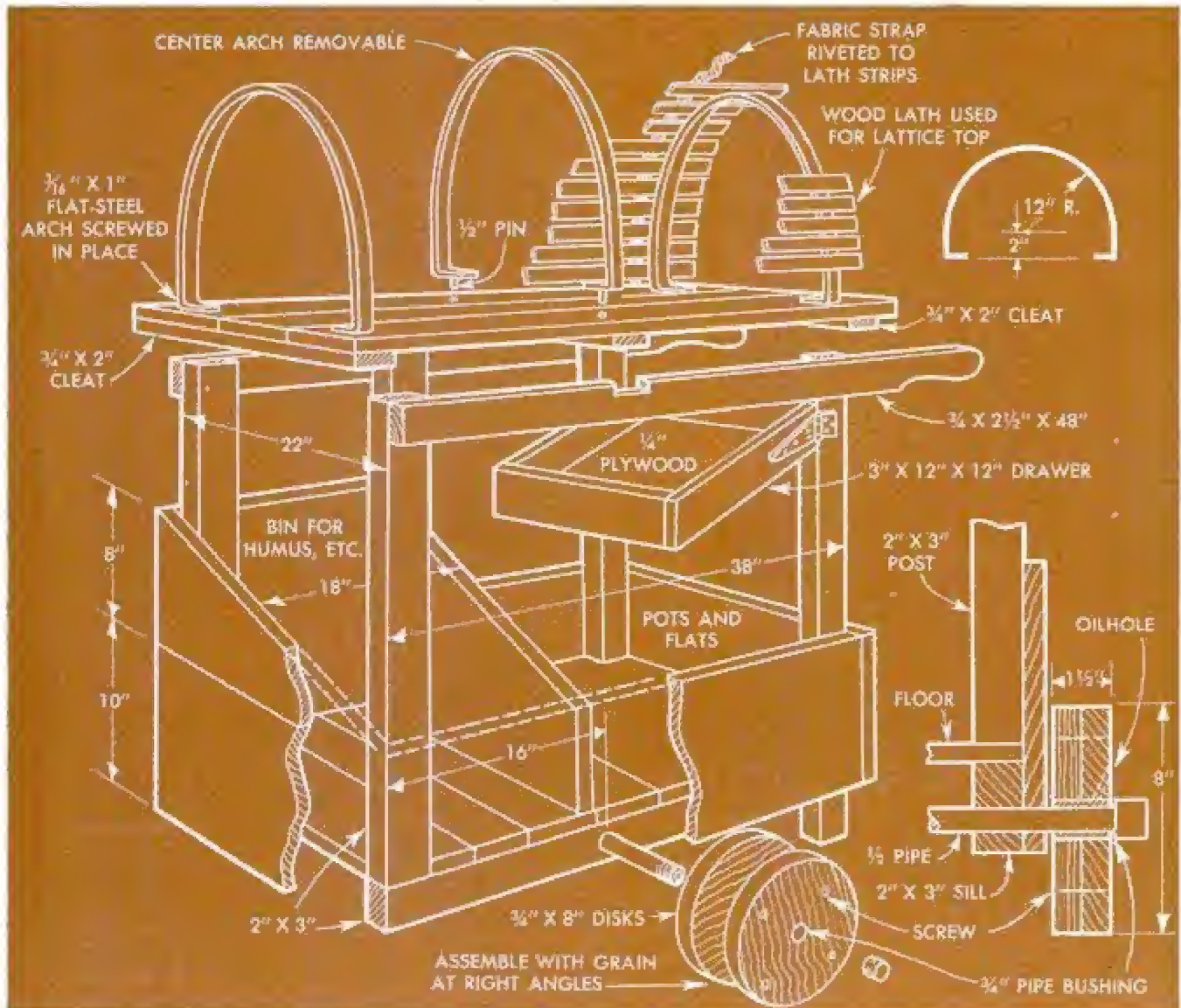
Tool rest can be positioned directly across the bed or set to permit turning edge of the work. The hardwood lathe bed is bolted to the top of the workbench



PORTABLE WORKTABLE

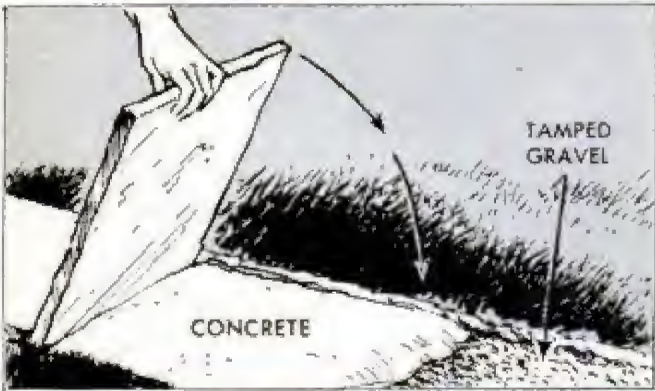
for the gardener

THIS combination worktable and "greenhouse" is sure to add to the enjoyment of working in your garden. A lattice, made by gluing and stapling wood lath to fabric strips, is drawn over three flat-steel arches to transform the table top into a lath house for hardening of tender seedlings. Fitted with wooden wheels, the entire unit can be moved easily from sun to shade as desired. When the lath house is not used, the lattice is allowed to hang at the back of the table and the center arch is removed to provide an unbroken expanse of work area. The body of the cart is divided into two bins—one for fertilizer, sand or sifted soil, and the other for pots and flats. A swinging tray for small tools is hinged to one leg.

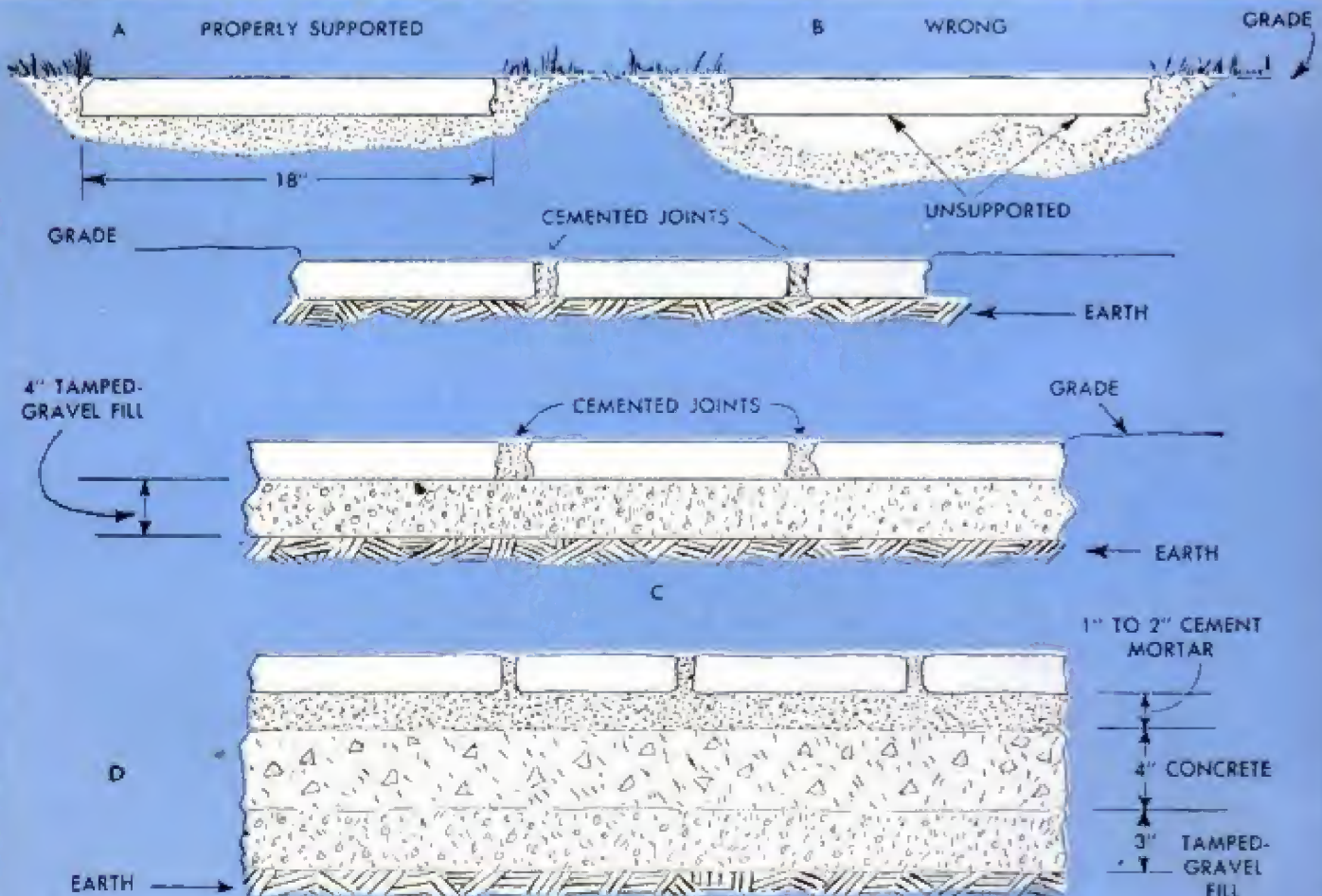


Laying

By Max Alth



LAYING FLAGSTONES is a natural for amateur stonemasons as there are no tricky corners to plumb and no mortar thicknesses to watch as in laying up a wall. The random patterns formed by simple stonework are what make flagstone walks, patios and driveways so very attractive. There are several methods of laying flagstone where only one layer, or course, is used. The first and simplest, is shown in detail A in the drawings below. Earth is excavated to a depth equal to the thickness of each individual stone and the recess is cut to a size and shape that will take the stone in a snug fit. In an area where the soil is firm and the drainage adequate this method is satisfactory, but it cannot be recommended as permanent construction. It is important to smooth the bottom of the excavation so that the stone is fully supported. If the bed of the excavation is uneven, portions of the stone will be unsupported as in detail B. This will cause the stone to tip sidewise. Some builders prefer to lay the stones edge to edge in a continuous excavation; the spaces between the in-

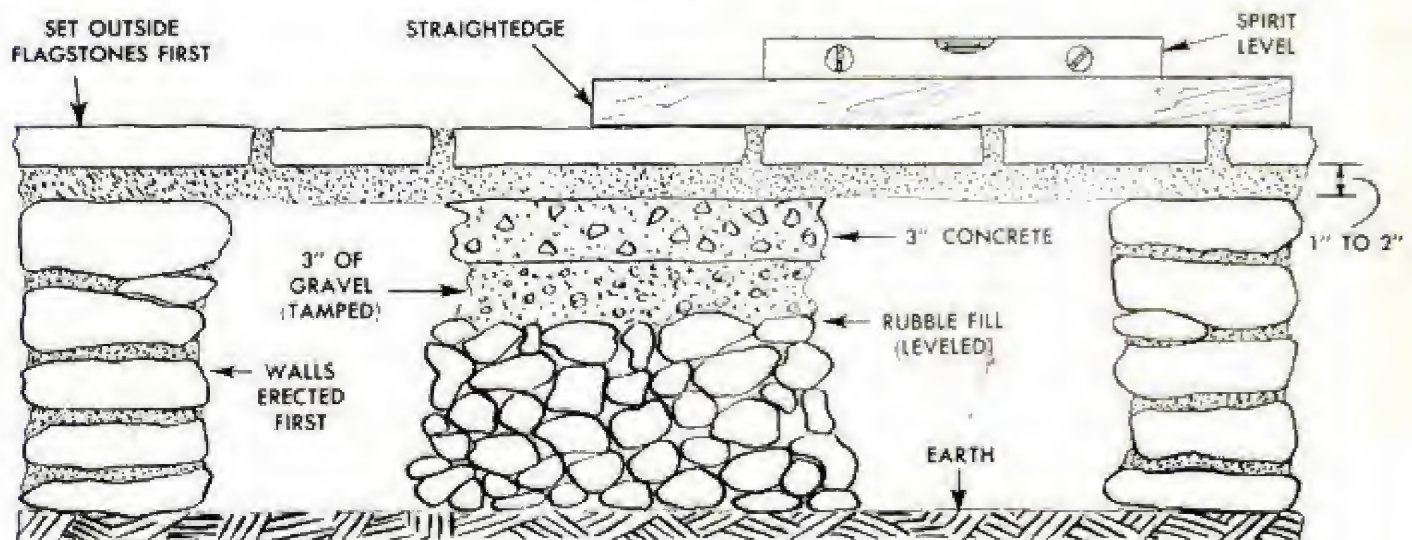
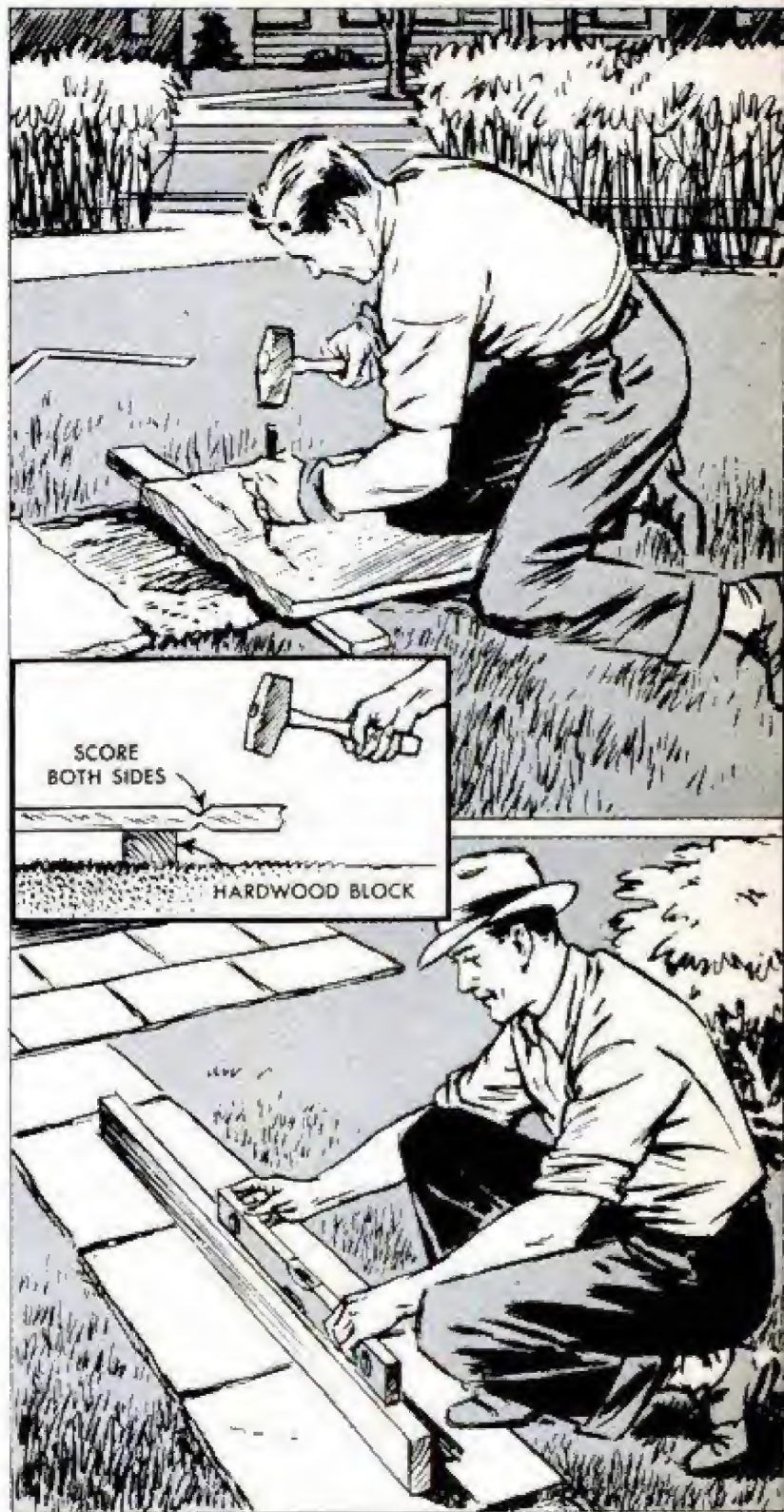


FLAGSTONE

dividual stones being filled with cement mortar. The best and most permanent construction of a flagstone walk is shown in section in detail C. on the opposite page. Here a continuous excavation is made to the width required and to a depth equal to the average thickness of the stones plus an additional 4 in. for a tamped-gravel fill. After the gravel has been thoroughly tamped with a special tamper as in the upper illustration on the opposite page, the stones are selected and laid in cement-mortar joints. Some builders spread a 1-in. layer of concrete over the gravel as in the center illustration on the opposite page.

One approved method of driveway construction is shown in detail D. Depths given for the gravel fill and concrete slab can be varied to suit local conditions. The thickness of the concrete may be increased to 5 in. and the gravel fill to 6 in. where drainage and service conditions require greater support.

Patio construction is shown in the sectional view below. Walls always should be laid up first. On soft soils the walls should be placed on adequate footings but on gravelly soils and clay soils footings will not be required unless the walls exceed 12 in. in height. The structure consists of enclosing walls, a fill consisting of rubble, tamped gravel and concrete. After this is fully cured the flagstones are laid in cement mortar and the joints filled as indicated. Use a straightedge and builder's level to determine the necessary slope to shed water and to assure that the surface is fairly uniform. Flat stones can be cut to any size desired by scoring both sides with a chisel. To break the stone after scoring, support it on a wooden block and strike the surface lightly near the scored lines as in the upper right-hand detail. Stonemasons use various methods of breaking stone but this procedure is fairly reliable with large flat stones.



Trellises Constructed Inside Steel Frames Provide Permanent Clothesline Supports



To rid his yard of a clutter of poles and clotheslines, one homeowner erected trellises having steel frames set in concrete for permanently supporting all the lines in one area. The top and sides of each frame are constructed from 4-in. I-beams, while a wooden 4 x 4 forms the bottom member. I-beams are faced on both sides with 2 x 4s held in place by bolts that pass through holes drilled in the web of a beam. Trellises made from lattice are mounted on the 2 x 4s.

Lathe Used for Mixing Paint



Small cans of paint, up to and including the pint size, may be mixed thoroughly and quickly with a lathe of either the woodworking or metal-cutting type. Fit a band of sheet metal around the

center of the can and grip the ends of the band in the chuck. To mix the paint, run the lathe for a few minutes at slow speed so that the paint will slosh from end to end in the can as the chuck rotates.

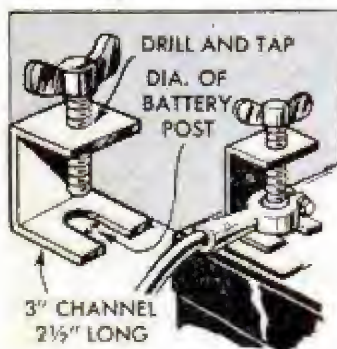
Rubber Glove Regains Shape From Inside Air Pressure



Usually turned inside out after being pulled off the hand, a rubber glove can be restored to normal shape once again by filling it with air and squeezing the glove as shown. After pushing the fingers back inside past the cuff, scoop the glove full of air and quickly pinch the open end shut to trap the air in the glove. Now squeeze the palm of the glove to force the fingers back to their original shape.

Before papering over old wallpaper, cover any grease spots that may be on the wall with a thin coat of shellac. This will prevent the grease from bleeding through the new wallpaper.

Battery-Cable Puller Saves Posts

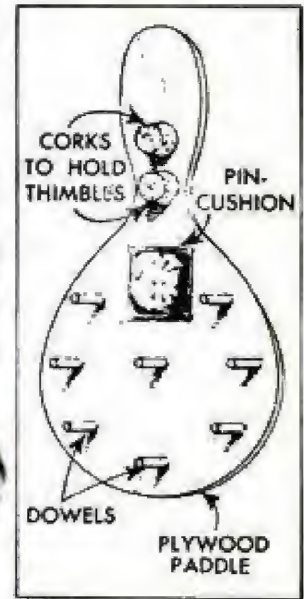


Car-battery posts will not be damaged if tight-fitting cable lugs are pried loose with this simple cable puller which is made from a section of steel channel and a thumbscrew. The puller exerts pressure

downward on the top of the post to free the lug. Use a 2 1/2-in. section of 3-in. channel, notching one side to fit around the battery post and tapping the other side for the thumbscrew. A bolt turned with a wrench will substitute for the thumbscrew. Additional bearing surface for the threads can be made by welding a nut over the hole in the channel. When the screw is tightened, the arms formed by the notched side of the channel lift the lug from the post.

This unique sewing kit can be made easily from a few odds and ends that are to be found in almost any household. Adapted from a child's paddle-ball toy, the kit makes it possible to display a variety of thread sizes and colors for easy identification and selection. Also mounted on the board are a pin-cushion and two corks used for holding thimbles. Thread spools are slipped over short lengths of dowel fitted into holes which have been drilled around the outer edge of the paddle as shown. After sanding the board, assemble the kit with glue and let dry. Now paint or stain the board as desired.

Sewing Kit Adapted From Paddle-Ball Toy Holds Spools of Thread for Easy Selection



Thermoplastic Toys Mended Quickly Using Soldering Iron

Broken toys made of thermoplastic can be mended by assembling the pieces and applying a hot soldering iron to the broken joints. The pieces are permanently joined when the iron melts the plastic and fuses

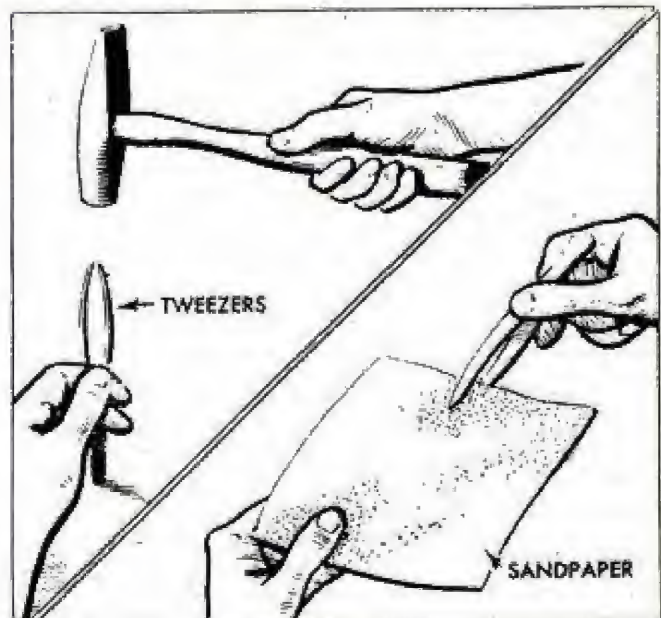
them together. After sufficient time has been allowed for the plastic to cool, the seams should be smoothed with a sharp knife and fine sandpaper.

Oscar J. Fisher, South Bend, Ind.



Tweezers With Sharpened Points Help Remove Splinters in Hand

Tweezers of the type shown often can be used effectively for extracting wood and metal splinters from the hands, provided the ends of the prongs are sharp enough. To sharpen them, hold the tweezers with the prongs pointed up and tap them lightly with a hammer to bend the points inward. Now sharpen them with sandpaper.



Stapling Plastic Screen

When applying plastic screen to a frame, better results will be obtained if the screen is stapled instead of tacked in place. The screen will have less tendency to pull or tear because a staple covers a greater holding area than a tack. Also, applying staples with a stapler is much easier than driving tacks with a hammer as one hand is left free to keep the plastic screen stretched tautly as it is being stapled.

Richard Hanscom, Elmhurst, Ill.

How to make

By Frank Reichstein

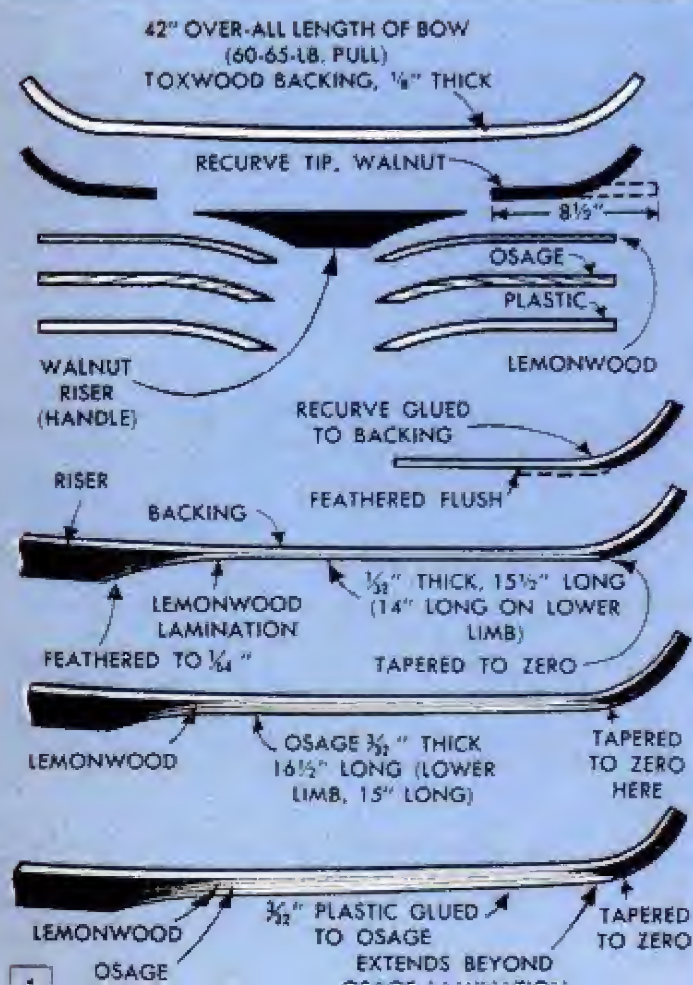
WOULDN'T YOU like to own a bow that will drive an arrow the length of five football fields? Then, according to expert bowmen R. A. Branaka and Clarence Haugen, you should take up flight archery. One of the first flight bows made by Mr. Branaka won a divisional national championship for Mrs. Branaka with a record shot of 395 yards. Mr. Haugen holds the divisional men's national title with a record shot of 547 yards.

Flight bows differ greatly from those made for target practice or hunting. They are short and sturdy, and because they are made of special laminated materials including several kinds of tough, springy woods, flight bows have tremendous driving power. Building a flight bow, as in Figs. 1, 2 and 3, is a procedure employing such hand operations as rasping, scraping, sanding and polishing a single piece to several sectional sizes. For this reason it is not possible to detail and describe each step of the process. The first step is to build the two bending forms detailed in Fig. 2, as you will need these as soon as you begin construction of the bow. One form is used for bending the recurve tips, Fig. 1, and the other is specially made for applying the glass-cloth (Conlon) strip to the backing as in the upper detail, Fig. 2. Special clamps are made for use with this form by bending $\frac{3}{8}$ x 1-in. flat steel to a U-shape and drilling $\frac{5}{16}$ -in. holes near the ends for a $\frac{1}{4}$ -in. pin which is inserted through a hole drilled in the form. The web of the clamp is drilled and tapped for a cap screw. This type of clamp makes

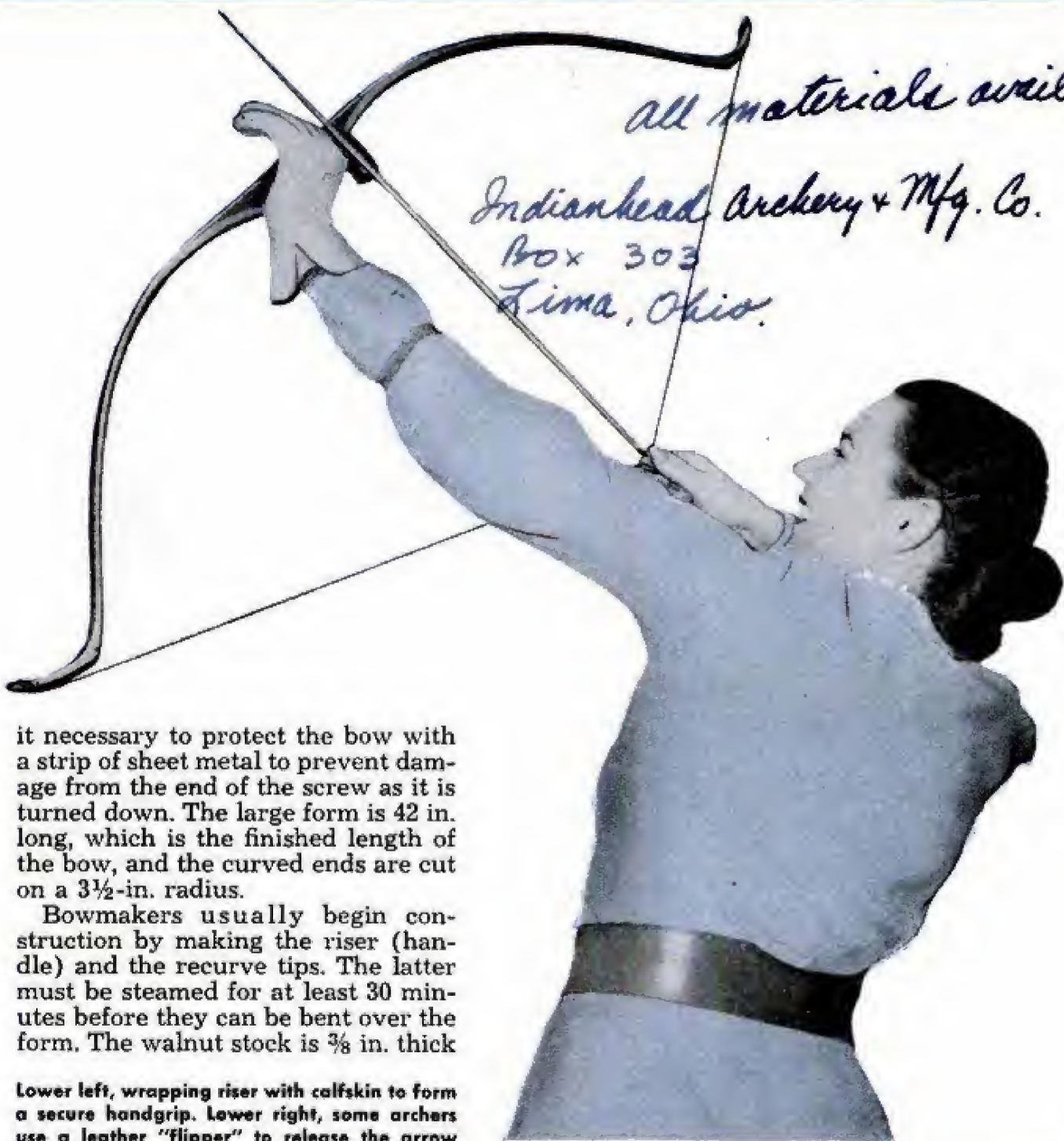
Flight bow being roughed with special scraper made from power-hacksaw blade. Operation is known to archers as tillering. Wood rasps also may be used



Many flight archers use a hook-type release. Hook holds the bowstring and a slight twist releases arrow



a FLIGHT BOW



all materials available:

*Indianhead Archery + Mfg. Co.
Box 303
Zima, Ohio.*

it necessary to protect the bow with a strip of sheet metal to prevent damage from the end of the screw as it is turned down. The large form is 42 in. long, which is the finished length of the bow, and the curved ends are cut on a $3\frac{1}{2}$ -in. radius.

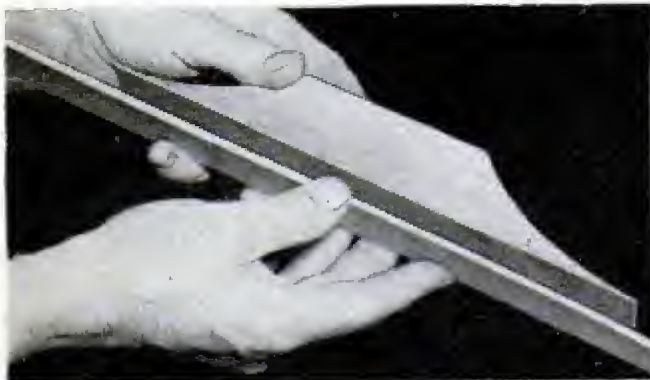
Bowmakers usually begin construction by making the riser (handle) and the recurve tips. The latter must be steamed for at least 30 minutes before they can be bent over the form. The walnut stock is $\frac{3}{8}$ in. thick

Lower left, wrapping riser with calfskin to form a secure handgrip. Lower right, some archers use a leather "flipper" to release the arrow





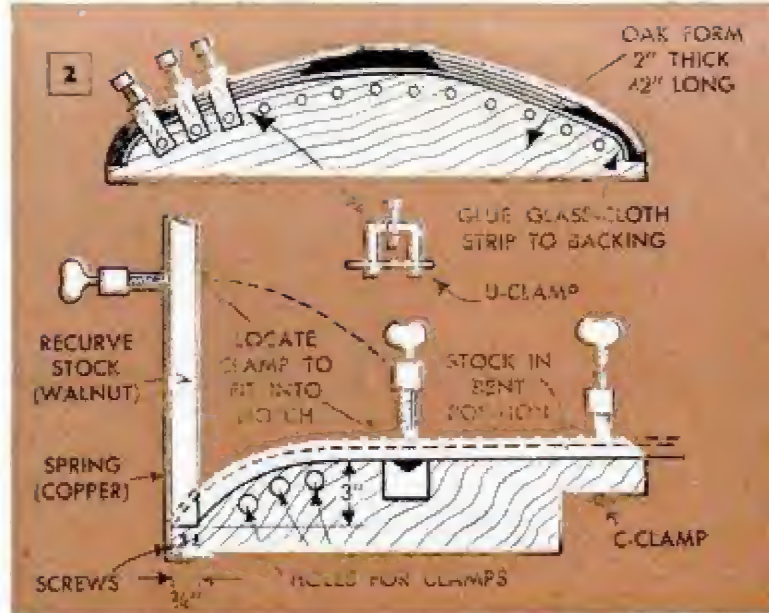
Arrows used in flight archery are made by professional arrow makers because they must be accurate



Riser is first glued to toxwood strip, which consists of resin-bonded layers of maple selected for grain

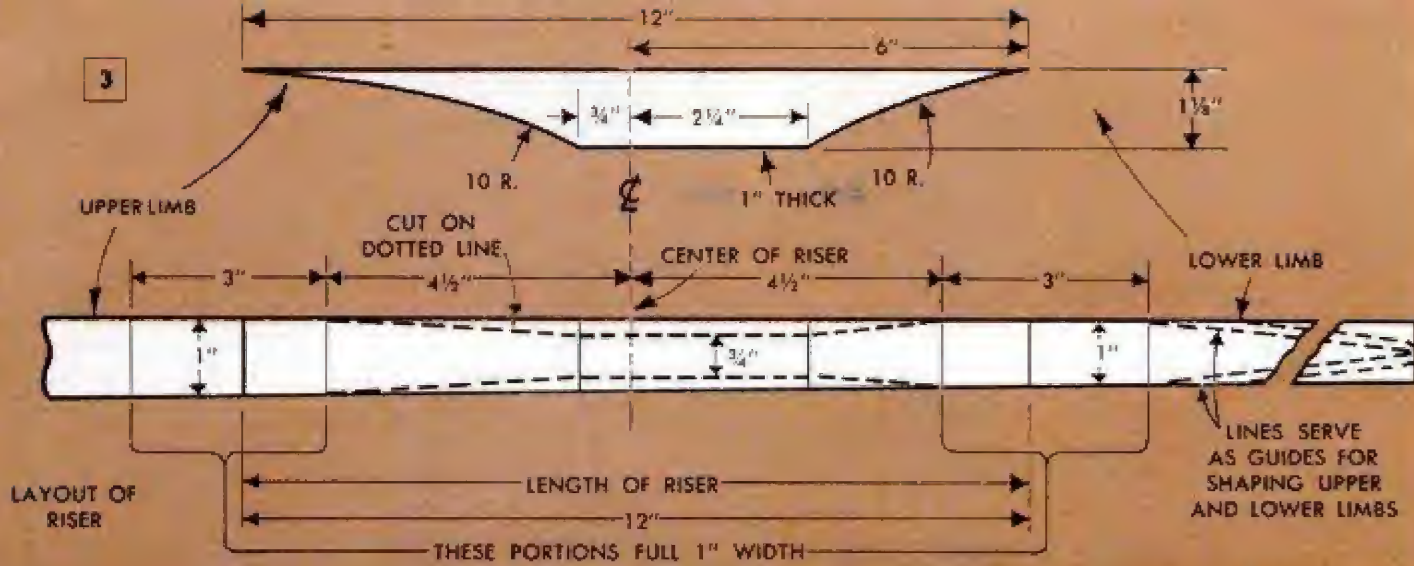


Above, the lemonwood lamination follows curve of the riser and is tapered to 1/64-in. thickness at the end. Below, professional bowmakers use a special bending jig of this type for bending recurve tips



and 1 in. wide. The tips are cut to 14-in. lengths before bending. The riser, Fig. 3, is cut with a 10-in. radius at each end. It should be noted that in the assembly of the laminations the riser is slightly off-center. Note also that the bow has two parts, the upper half being referred to as the upper limb and the lower half as the lower limb. After the riser has been sawed to the rough form and the curved surfaces smoothed by sanding, it is glued to the center of the toxwood backing strip. (Toxwood consists of thin layers of selected maple bonded with a special resin adhesive.) Before the glue dries, wipe off all the excess so that a smooth joint results. Next, the walnut recurve tips are steamed and bent. After drying thoroughly in the forms, they are removed and cut to 8½-in. over-all length and glued to the toxwood backing. The lower ends of the tips are feathered flush before the lemonwood laminations are applied. Note that these are 14 and 15½ in. long, Fig. 1. At the riser ends, the lemonwood laminations are tapered to 1/64 in., but are feathered or tapered to zero at the outer ends where they join the recurves. Apply the Osage laminations in the same manner, but note before cutting stock that one is 15 and the other 16½ in. long. Locate the center of the bow and measure 4½ in. each way. Then bandsaw the riser to the form shown by the dotted lines in Fig. 3. The recurve tips are tapered by hand, the dotted lines serving merely as guides to the rough size. At this stage the bow is ready for nocking and rough shaping, or tillering.

The recurve tips are nocked for the bowstring as in the center photo on the opposite page. Use a 3/16-in. round file and file the notch at approximately the angle indicated. The notch should continue around to the opposite side of the tip. Be sure that it is cut to the same depth and at the same angle on both sides of the tip. Brace (string) the



bow with a linen bowstring. Then hold it firmly in a padded vise and scrape the limbs to bring the bow to the proper tiller, or bend. This is one of those jobs that must be done by stages with frequent periods of testing with a spring scale. Bowmakers usually use a fish scale for testing. Scraping can be done with a cabinet scraper with fair success but bowmakers prefer a discarded power-hacksaw blade having one side ground to a cutting edge. As the scraping proceeds, check the pull with the spring scale, drawing the bowstring 24 in. from the center of the bow at each trial check. As each check is made, note carefully the arc of each limb of the bow. Both should flex to the same arc during the test. If not, scrape excess stock from the stiffer one until both flex uniformly when the bow is braced.

When tillering and scale checks bring the pull to about half the desired weight of 60 to 65 lbs., the bow is ready for application of the plastic, which is glued and clamped in place in the same manner as the other laminations. Application of the plastic will increase the pull somewhat beyond the 60 to 65-lb. limit and it will be necessary to continue the scrape-and-weight-check procedure until the desired pull is restored.

The final step in building up the laminations is the application of a Conlon (glass cloth) strip to the toxwood backing. A length of glass cloth slightly longer than the bow is placed over the large bending form. Coat the toxwood backing with glue and place the bow on the form over the glass-cloth strip. Then apply U-clamps and allow to dry thoroughly. Once more it will be necessary to scrape the bow to restore the proper pull. Work carefully and check frequently this time or you may exceed the limit. When the pull has been correctly established, sand the bow to a glass-smooth surface and apply two thin coats of varnish.



Upper photo, one of several types of plastic over-draw attachments. Center, cutting nocks (notches) in the recurve tips of a flight bow. Below, bowmakers finish the bow by dipping in tank containing varnish



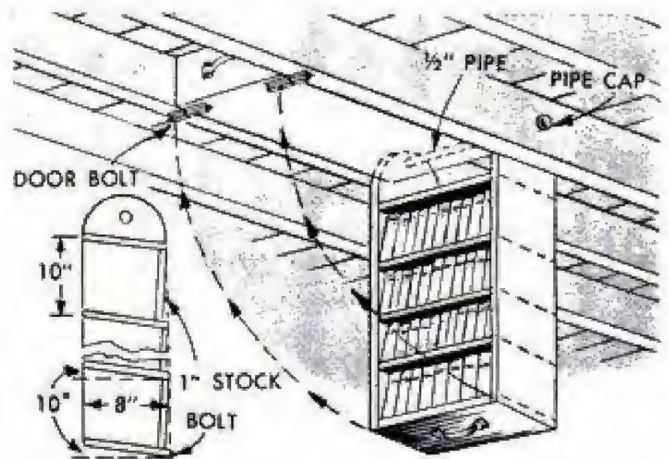
Using slabs of selected native stone set in concrete mortar, one homeowner constructed this attractive fireplace in his back yard to provide a gathering place for outdoor dining and recreation. The fireplace is erected around a cookstove having grates built for burning wood and has two compartments covered with concrete slabs which serve as tables in the preparation of food. Extending from the sides of the fireplace, slab-covered stonework furnishes benches for diners. The fireplace rests on a concrete foundation which also forms an apron covering the work area in front of the installation.

Outdoor Fireplace Has Tables and Benches Built Into Single Unit for Convenience



Box For Storing Little-Used Items Pivoted Between Floor Joists

This handy box is ideal for storing books and magazines, as well as seasonal sporting and camping equipment, out of the way between floor joists. One end of the box pivots on two lengths of pipe joined by a coupling. The pipe is inserted in holes drilled in adjacent joists and capped to hold it in place. If a ratchet brace is not available for drilling the holes, drill small blocks to take the pipe and screw them to the sides of the joists for support. The opposite end of the box, which is lowered to gain access to the contents, is held in place by sliding door bolts when stored. Shelves should be installed at a 10-deg. angle to help prevent the books



from falling out when the box is lowered. A list of the contents may be posted on the box for quick reference.

Supply of Matches Doubled By Splitting Each One



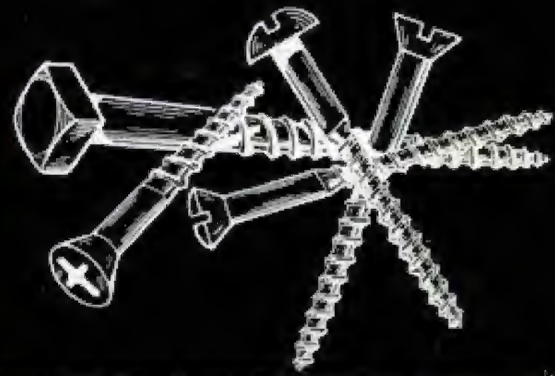
If you are on a camping or hunting trip and find your supply of matches running short, try splitting each one in half. You can do this with a safety-razor blade if one is at hand, or with a thin, sharp knife blade. The matches can be split quite accurately if you are careful in handling the blade. In most cases you will find that half a match will serve just as well as a whole one.

Repairing Plastic Toys

Plastic toys and novelties which have been cracked or broken often can be repaired by cementing with fingernail-polish remover or acetone. When applying the solvent, be careful that it is not spilled on the surface of the article.



1

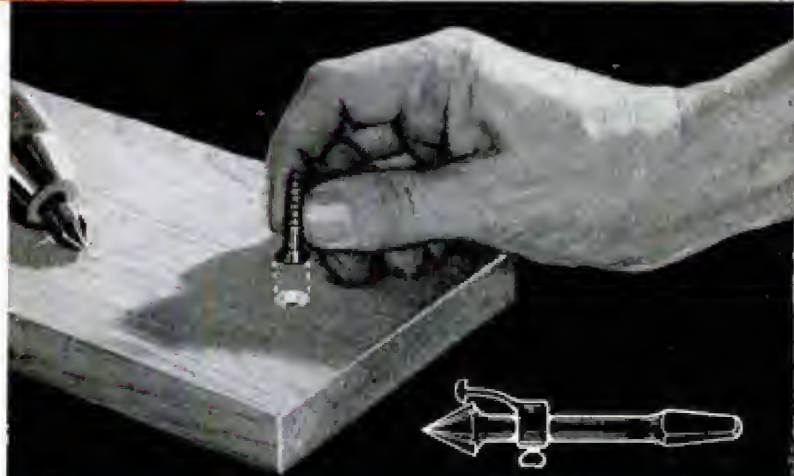


Fastening With WOOD SCREWS

By E. R. Haan

WOOD SCREWS have greater holding power than nails. They also permit work to be taken apart and reassembled without damage, using all the original parts. Modern wood screws are gimlet pointed. This is a comparatively recent development. Formerly, wood screws were made with blunt points similar to the modern cap screw and always required the drilling of suitable pilot holes. Wood screws most commonly used are made of steel as they are much stronger and the slotted heads will withstand high driving torques, either with hand or power screwdrivers. Wood screws also are made of brass, bronze, copper and stainless steel for special uses where resistance to corrosion is important. Steel screws often are plated with zinc, cadmium, brass or chromium to make them rust resistant and add to their holding power.

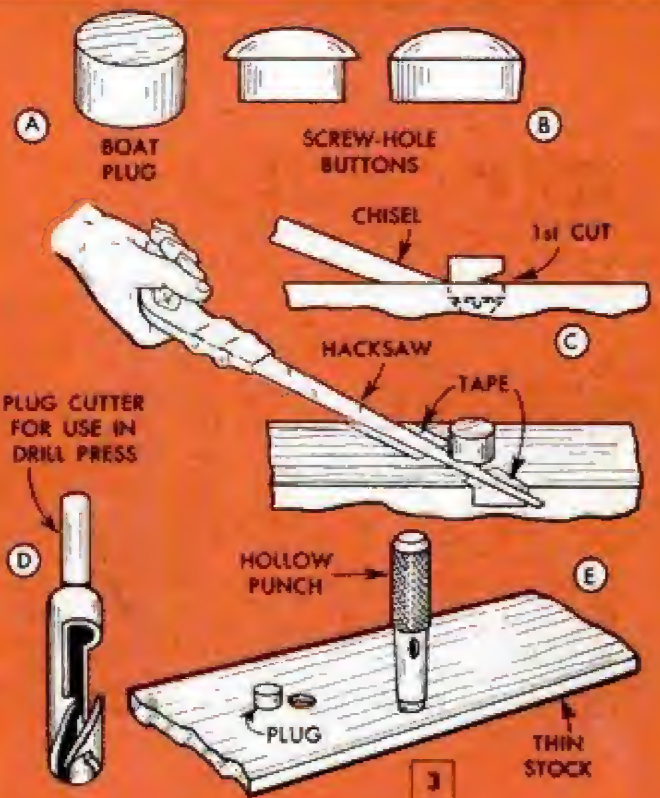
Types and sizes: Common wood screws are available with flat, round or oval heads having single or cross slots. The cross-slotted, or Phillips, head requires a special type of driver but provides four surfaces to take screwdriver thrust, or torque. Common screws vary in length from $\frac{1}{4}$ to 6 in. and are available in gauge thicknesses from No. 0 to No. 30. The sizes most commonly used range from No. 3 to No. 16. Larger sizes are rarely used in ordinary work. Lag screws have square bolt-type heads and are driven with a wrench. They come in fractional sizes. Certain types of screws also are available for special purposes, such as attaching ornamental-iron cabinet and door hinges, and latches. These are supplied with a square head similar to common

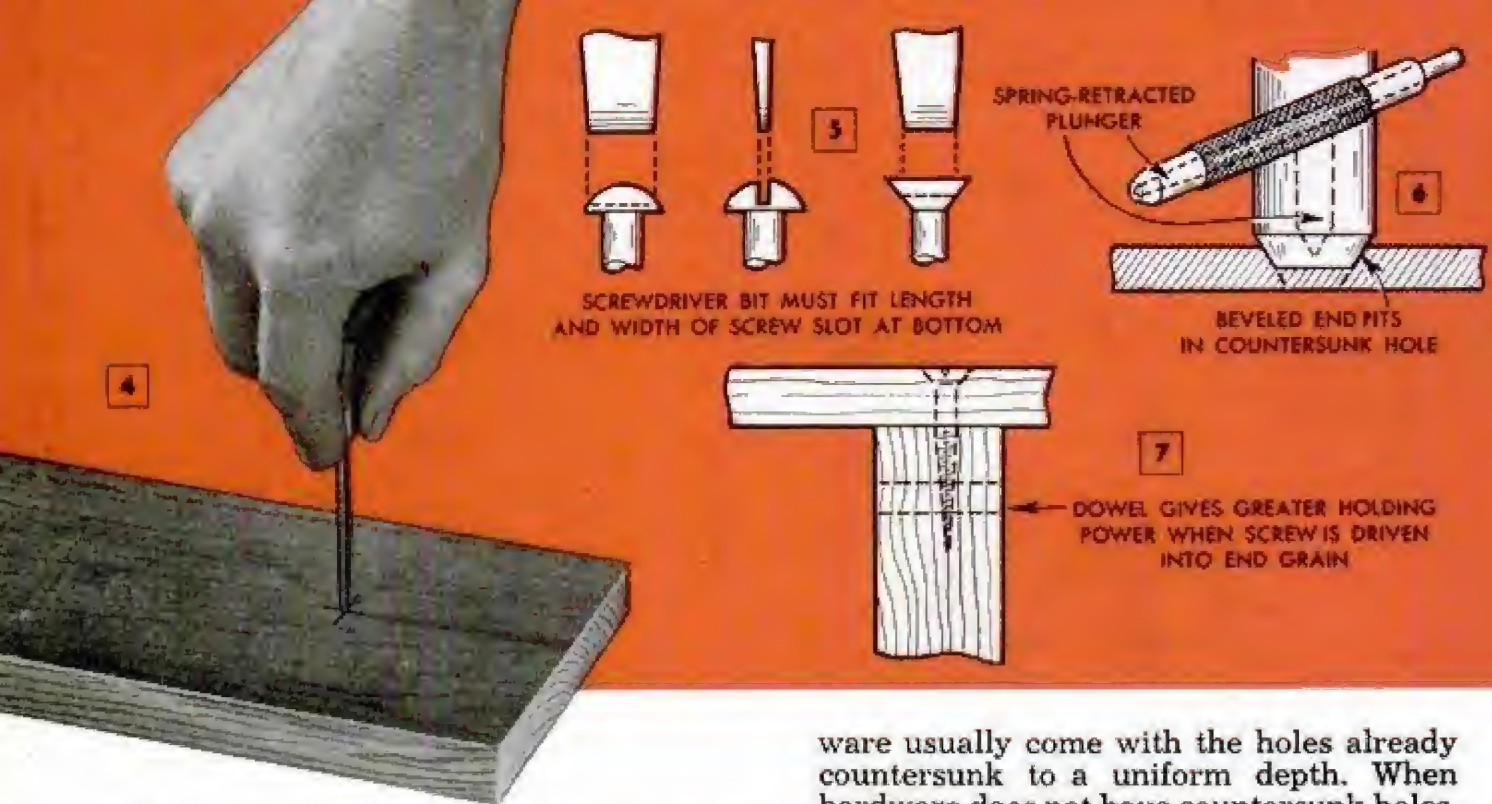


2



DEPTH GAUGE ON ROSE COUNTERSINK





lag screws, except the head is cross slotted.

Pilot and shank holes: Screws in the smaller sizes can be driven into softwoods without drilling either shank or pilot holes. For accurate work it is necessary to make a shallow starting hole with a punch or awl, Fig. 4. Larger screws will require shank and pilot holes for easy driving and to prevent splitting of the wood, especially when the screws are driven near the edge of the stock. When using twist drills for drilling both hole sizes, drill the pilot hole first. In softwood, the pilot hole should be about 70 percent of the core diameter, measured at the bottom of the threads, and should be drilled to a depth equal to about two thirds the length of the threaded portion. For hardwood, the figure is 90 to 100 percent, and the hole should be drilled to a depth approximately equal to the length of the threaded portion. The screw will drive easier in hardwood if the shank hole is slightly larger than the diameter of the shank. The shank hole always should be drilled to a depth equal to the length of the shank. When boring pilot and shank holes with auger bits, bore the shank hole first, then the pilot hole, as the larger bit will not center accurately or feed into the wood properly if the smaller hole is drilled first.

Countersinking: Holes for flat or oval-head screws should be countersunk to the proper depth so that when the screw is turned in, the edge of the head will be flush with the surface. When countersinking, check for proper depth by holding the screw over the hole as in Fig. 2. Where a number of holes are to be countersunk to the same depth, use a countersink depth gauge of the type shown in Fig. 2. Hinges and other types of screw-fastened hard-

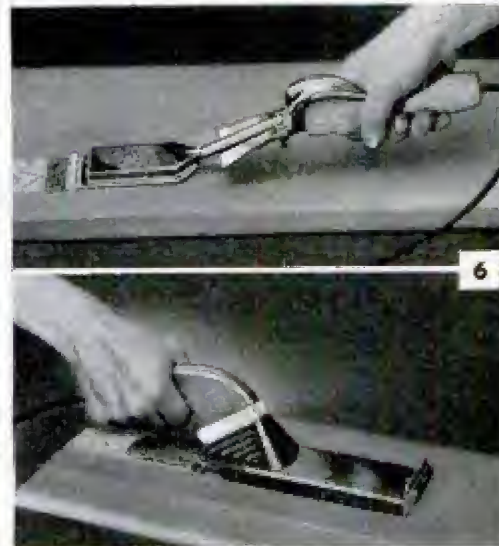
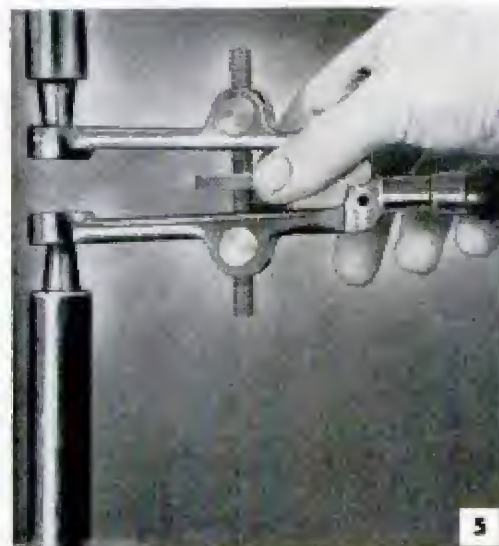
ware usually come with the holes already countersunk to a uniform depth. When hardware does not have countersunk holes, use round-head screws of a shank size that will fit the holes.

Counterboring: When it is desirable to conceal a screw entirely, counterbore the shank hole so that the screwhead can be sunk $\frac{1}{16}$ in. or more below the surface. The hole then can be filled with a suitable wood filler if the surface is to be painted. If the wood is to be stained or finished in the natural color, glue a boat plug or a screw-hole button in the counterbore as in details A and B, Fig. 3. Plugs are cut with the grain running horizontally so that by using a plug of the same kind of wood it is possible to match the grain quite closely. Plugs should project $\frac{1}{16}$ to $\frac{1}{8}$ in. above the surface when driven home. After the glue is dry, cut the plug nearly flush with a wood chisel or key-hole hacksaw, Fig. 3, C. Then sand flush.

Cutting plugs: Screw-hole plugs can be made on a drill press by using a plug cutter of the type shown in detail D, Fig. 3, or they can be cut by hand with fair accuracy by using a hollow punch of the type shown in detail E.

Tips on driving screws: It's important to use a screwdriver having a straight bit that fits the screw slot properly. The width of the bit, or blade, at the tip should be equal to or slightly narrower than the width of the screw slot at the bottom, Fig. 5. The thickness of the blade should be only slightly less than the width of the slot. When attaching hardware having countersunk holes, cabinetmakers lay out the holes with a centering punch of the type shown in Fig. 6. The correct method of starting a screw is pictured in Fig. 1. When it is necessary to drive a screw into end grain, insertion of a small cross dowel, Fig. 7, will add to its holding power.

SHOPPING FOR TOOLS



1. PAINTER'S BRUSH—the tedious job of cutting or enameling quarter painting with two exterior work. It is m 5½ and 9 in., and is for easy-manipulation

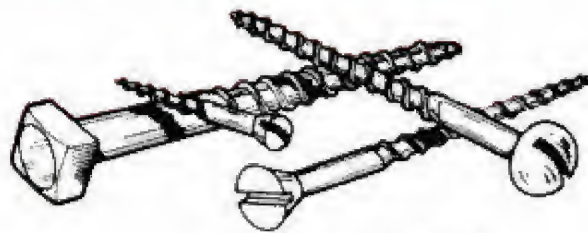
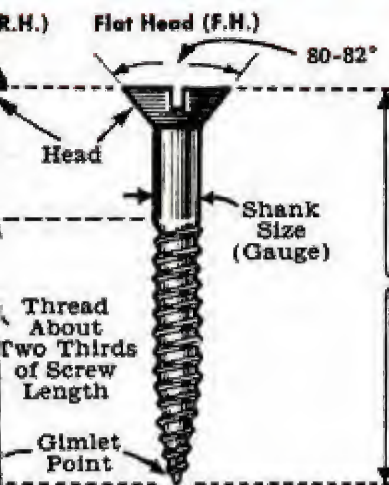
2. PORTABLE WELDER—type is made for home and others who need supplied in three types with accessories, also for with cart for 110 third type is designed

3. SELF-SETTING DRILL PRESS—drill press and milling packing which must conventional clamping novel rocker-type bolt faces which permit lowly at any height

4. FOUR-IN-ONE BENCH TOOL—forms, shears and punches to ½ in. by a single stroke. Supplied with punches three sizes, also bending and a rivet die for holding. Height of unit is 5

5. ELECTRODE DRESSER—is designed for removing tip that forms on the. Furnished with replaceers for standard, trunc and radius tips in No. Tips can be dressed w

Get on WOOD SCREWS



DRIVING SCREWS

Screw must be thick enough to resist shearing. Entire threaded section should enter piece to which something is fastened. Use screwdriver having blade tip of correct thickness and width to fit screw slot snugly. Rub screw thread on soap or beeswax to make driving easier.



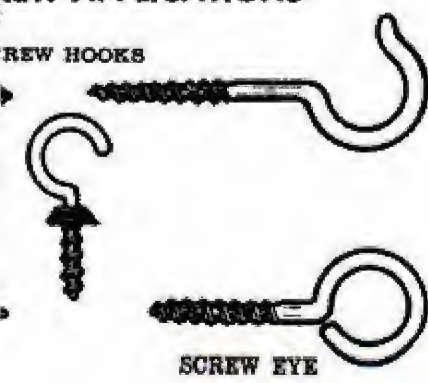
	7	8	9	10	11	12	14	16	18	20	24
	.151	.164	.177	.190	.203	.216	.242	.268	.294	.320	.372
	3/32-	5/32+	11/64+	3/16+	13/64-	7/32-	15/64+	17/64+	19/64-	21/64-	3/8
	22	18	14	10	4	2	D	I	N	P	V
	44	40	37	33	31	30	25	18	13	4	1
	49	47	44	40	37	33	31	30	25	18	13
	51	48	45	43	40	38	32	29	26	19	15
	53	52	51	48	45	43	40	38	32	29	26
	16	15	14	13	12	11	10	9	8	8	7
	105	.332	.358	.385	.411	.438	.491	.544	.597	.650	.756

Screws have gimlet points; cone and diamond points are special. Length is measured from the threaded tip to the largest bearing surface of the head. Body diameters—gauge sizes—increase in steps of .013 in. Tolerance from speci-

fied sizes ranges from .004 in. plus, to .007 in. minus. A 10 percent variation of threads per inch is permitted. Head dimensions of wood screws are identical to those of machine screws of the same size and type.

IN EACH GAUGE										
1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2	4	4 1/2	5	
6-20	6-20	6-20	6-20	8-20	9-24	10-24	12-24	14-24	14-24	

NEW APPLICATIONS



LAG SCREWS — LENGTHS AND DIAMETERS (in inches)

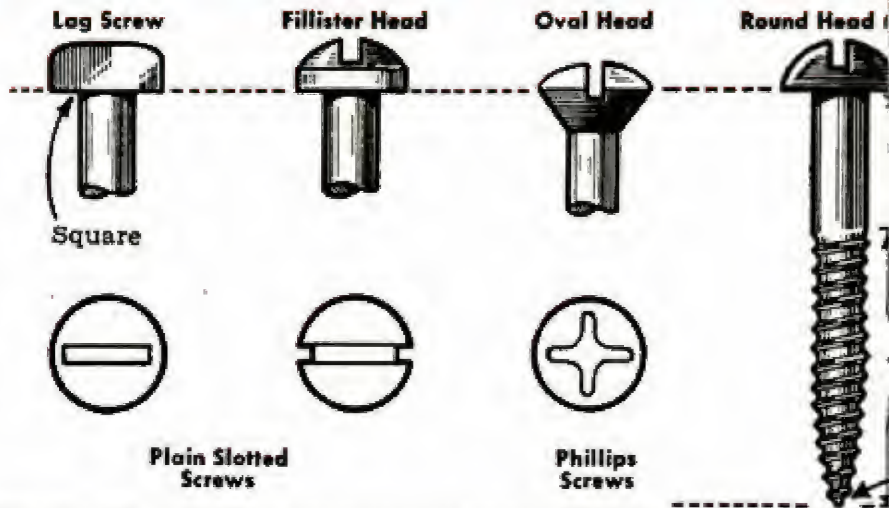
Lengths	Diameters			
	3/4	3/8, 7/16, 1/2	5/8, 3/4	7/8, 1
1	x	x		
1 1/2	x	x	x	
2, 2 1/2, etc., to 10	x	x	x	x
11 & 12		x	x	x
13 to 16			x	x

Popular Mechanics Data Sheet

WHEN YOU BUY SCREWS

Specify (1) length, (2) gauge number, (3) type of head—flat, round or oval, (4) material—steel, brass, bronze, etc., (5) finish—bright steel, blued, cadmium, nickel or chromium plated

Example: 1 3/4" No. 10 flat-head (f.h.) steel, cadmium-plated wood screw



Gauge Numbers		0	1	2	3	4	5	6	
Actual Cross Section of Screws		●	●	●	●	●	●	●	
Basic Decimal Diameter		.060	.073	.086	.099	.112	.125	.138	
Fractional Dia. Nearest 64th		1/16-	5/64-	5/64+	3/32+	7/64+	1/8-	5/64-	
Drill Number		52	47	42	37	32	30	27	
Pilot or Anchor-Hole Sizes	Hard-wood	Slotted Screws	70	66	56	54	52	49	47
		Phillips "			70	66	56	54	52
	Soft-wood	Slotted "	75	71	65	58	55	53	52
		Phillips "			75	71	65	58	55
Threads Per Inch		32	28	26	24	22	20	18	
Maximum Head Diameter		.119	.146	.172	.199	.225	.252	.279	

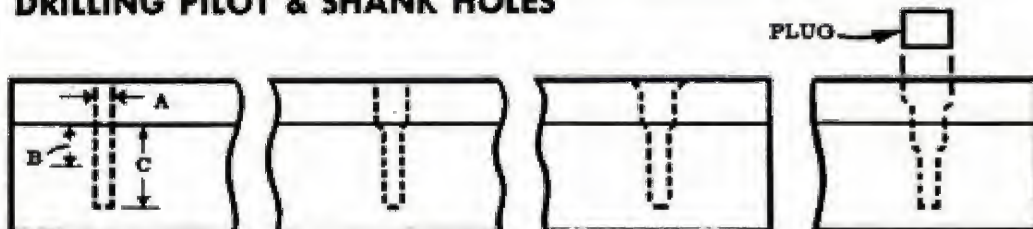
Drill sizes for body clearance holes are given in either numbered or lettered drill sizes. Dimensions are given in decimal or fractional parts of inches. In general, pilot holes should be about 90 percent of screw-core size for hard-

wood, 70 percent for softwood. In end grain and also in softwoods, such as pine, it frequently is unnecessary to drill a pilot hole.

There are nearly 300 standard wood screws of various sizes, lengths and types. Regular

SCREW LENGTHS MATCHING GAUGES									
Lengths In Inches	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2
Gauges	0-4	0-8	1-10	2-12	2-12	3-14	3-16	4-18	4-20

DRILLING PILOT & SHANK HOLES



1st: Pilot hole A: 70% of screw-core dia. for softwood—90% for hardwood. B: 1/2 thread depth for softwood. C: Full thread depth for hardwood

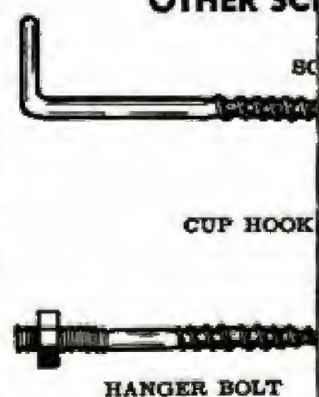
2nd: Shank hole equal in dia. and length of screw shank

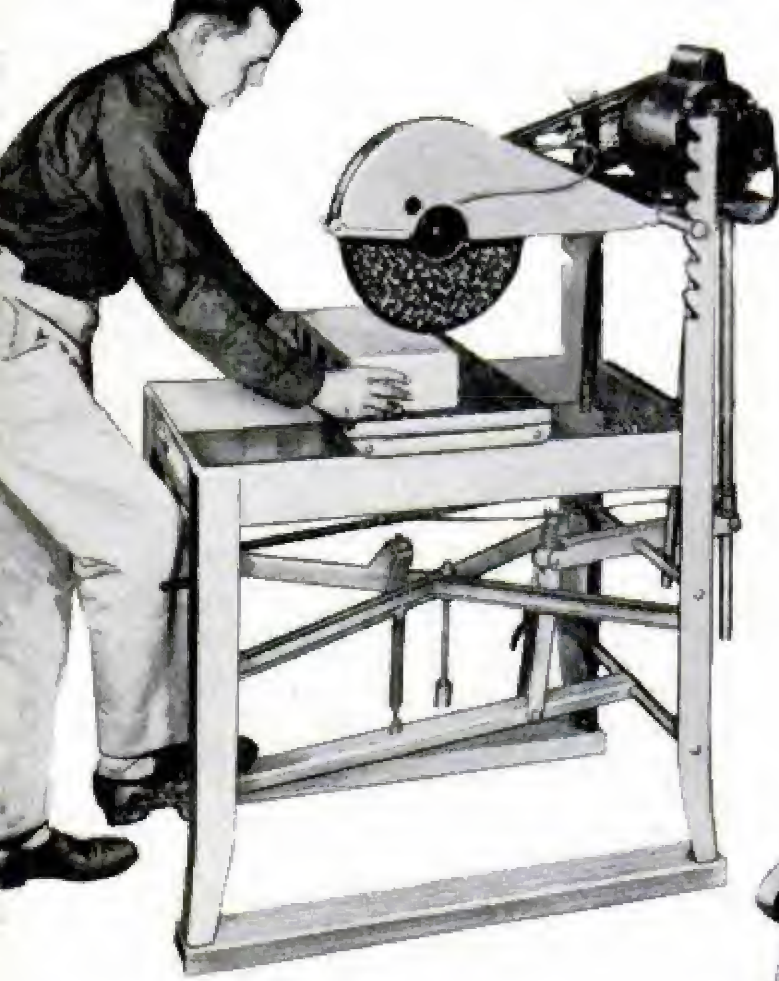
3rd: Countersink so flat-head screws will be flush

Counterbore for plug to conceal screw first with auger bit but last with twist drill

Note: When using auger bits, first bore the hole for the plug. Then bore the body clearance hole and finally the pilot, or anchor, hole

OTHER SCREWS





GUIDE speeds up
g in sash, painting
ound and trim, and
rs in interior and
de in two widths,
ted with a handle
in close quarters

of the generator
craftsmen, farmers
light welder. It is
s—generator only
generator and mo-
voltage a.c. or d.c. A
or use on 220 volts

MP for use with
machines eliminates
e used under con-
vices. Unit has a
er and curved jaw
king work secure-
without slippage

CH TOOL rivets,
shes sheet metal up
ke of a hand lever.
and die plates in
g and forming dies
low or solid rivets.
n., weight 6 lbs.

ER for spot welders
g the "mushroom"
ends of electrodes.
able hardened cut-
tated-cone, domed
and No. 2 tapers.
hen current is on

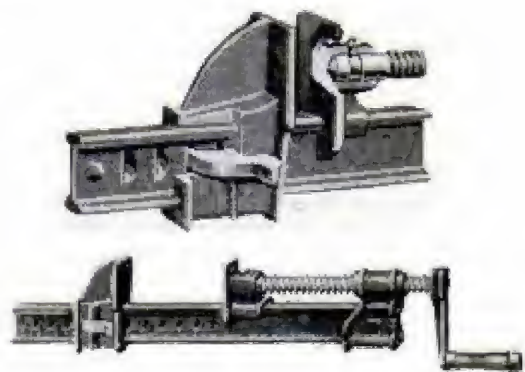
6. HIGH-TEMPERATURE PAINT PEELERS are now supplied in two types and sizes having new ceramic elements giving 1000-deg. operating temperature. The larger size strips paint from large surfaces at the rate of 6 to 10 ft. per minute and is especially suited to paint removal on house exteriors, boats, and furniture

7. CONVERTIBLE MASONRY SAW converts to a track saw for cutting through concrete preparatory to installing water, sewer or gas lines. The motor-and-arbor assembly is simply removed from the regular stand and placed on a four-wheeled cart as shown in the right-hand photo. Cart is available as a separate unit

8. CARPENTER'S BAR CLAMPS are now available with a new locking device for the sliding jaw. A pivoted steel dog located on the side of the movable jaw engages notches spaced $\frac{1}{2}$ in. apart and pressed into the center of the I-beam or bar which forms the body of the clamp. Jaw slides freely when the dog is released

9. SNAP-IN, SNAP-OUT GLASS CONTAINERS provide safe storage for the innumerable small parts and fasteners that must be kept in order in the shop. Baby-food jars in the 5 and 8-oz. sizes snap into pressed-steel holders which are available in 12 and 21-in. lengths holding five and eight jars with contents always in full view

7



8



9

Attractive Garden Ornament Constructed From Scrap Materials

Requiring only simple tools and little more than scrap materials to make, this simulated "wishing well" will provide an attractive ornament for your garden or back yard. Materials needed for the job are a discarded keg, several lengths of 1 x 1-in. stock and a few shingles. Tin cans with the tops removed and fitted with wire handles are hung from a crosspiece to give the effect of well buckets. When completed, the ornament should be given one or two coats of brightly colored paint. Ferns or flowers may be grown in a pan containing soil set in the keg opening.



Automobile Frame Provides Sturdy Clothesline Supports

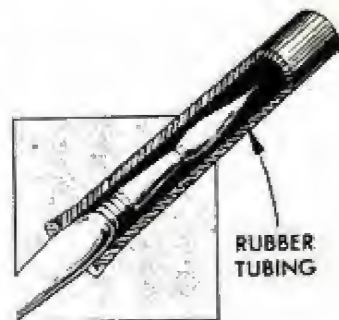
Cut in half, and with each half set vertically in concrete, an old automobile frame will provide sturdy clothesline supports. Each should be fitted with a 3-in. pipe crosspiece 4 to 6 ft. in length, depending upon the number of lines used. Crosspieces are drilled for eyebolts to which separate lengths of clothesline will be fastened.

A. M. Wettach, Mt. Pleasant, Iowa.



Tubing Shields Water-Color Brush

Pressing a section of rubber tubing over a camel-hair artists' brush forms a sheath that protects the bristles when the brush is not in use. Pressed over the large part of the brush behind the ferrule, the sheath will hold securely and provide clearance around the bristles, not disturbing the pointed shape of the brush. Rubber fountain-pen bladders can also be used for this purpose.



George Kapitan, New York City.

Stovepipe Cuts Strawberry Runners

A short length of stovepipe, fitted at one end with a carrying handle, furnishes an effective device for cutting strawberry runners. The handle is a length of dowel or broomstick, which is fastened across the pipe just below the top edge and held in place by screws. The top edge may be turned down to protect the hands from possible injury.



Mrs. Michael Fey, New York City.

KNOW YOUR CAR'S NERVOUS SYSTEM

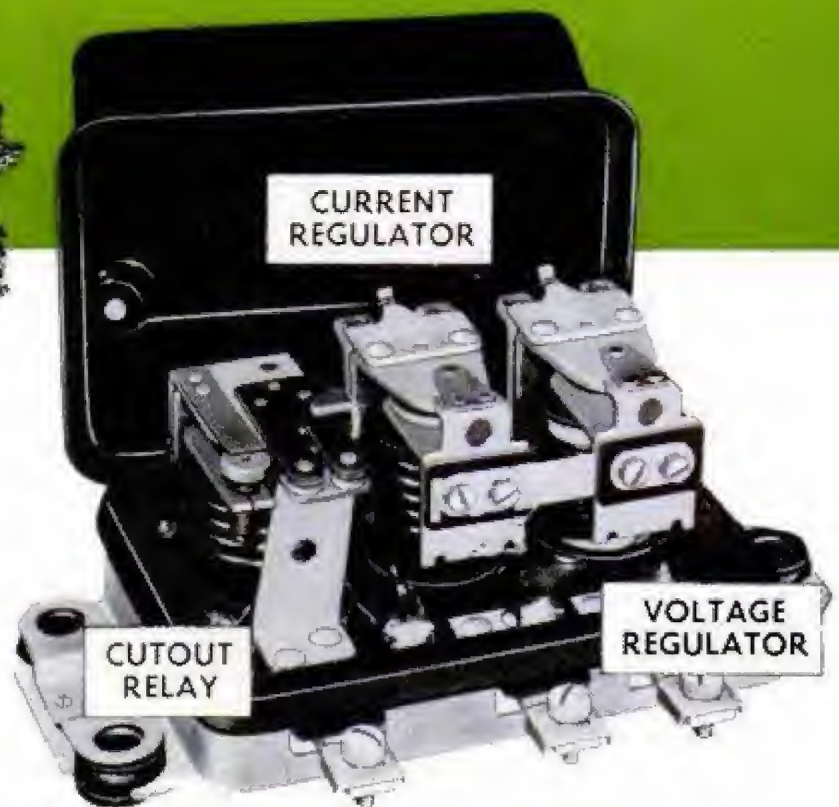
The Generator Regulator

By W. K. Mitchell
and Howard B. Birt

TODAY'S PASSENGER CAR with its many electrical accessories is, of necessity, equipped with a generator capable of very high current output. To prevent the generator from damaging the electrical system by producing too high a voltage, or ruining itself by producing too much current, it must be controlled by a generator regulator—the “watchdog” of the electrical system.

The basic function of the regulator is simple. Regardless of its type, its manufacturer, or its location in the car, the regulator does only one job—it limits the output of the generator. The regulator does this by controlling the flow of current in the field coils of the generator. Such control is effective because the output of the generator at operating speed depends on the strength of the magnetic field produced by the field coils. In turn, the strength of the magnetic field is dependent on the current flowing in the field-coil windings. This current flow is, therefore, the key to the generator output. To control the field current, the regulator intermittently inserts a fixed resistance in series with the field circuit at the proper time. Note the wiring diagram, Fig. 2.

The majority of modern passenger cars are equipped with a three-unit regulator similar to the one pictured above. This regulator is designed for use with the shunt-type generator found in most late-model cars. Its three units are the cutout relay, current regulator and voltage regulator. The development of this type of regulator has made it possible to limit generator voltage and current effectively at all generator speeds.



The data on regulator construction and wiring circuits described in the following paragraphs apply to Delco-Remy units, which are used on all General Motors passenger cars and various other independent makes. Although Ford cars use equipment of similar construction, they are wired somewhat differently.

The cutout relay is an electromagnetic switch which closes the generator-to-battery circuit when generator voltage is sufficient to charge the battery. When the generator slows or stops, or if for any reason the voltage drops to a point where it will not charge the battery, the cutout relay opens the circuit. This prevents a reverse flow of current from the battery to the generator, which could damage the generator.

As shown in Fig. 2, the cutout relay has two windings assembled on the same core. These consist of a series winding of a few turns of heavy wire (indicated by the solid line) and a shunt winding of many turns of fine wire (indicated by the broken line). The shunt winding is connected so that generator voltage is impressed on it at all times. The series winding is connected in series with the charging circuit so that generator output passes through it when the relay points are closed.

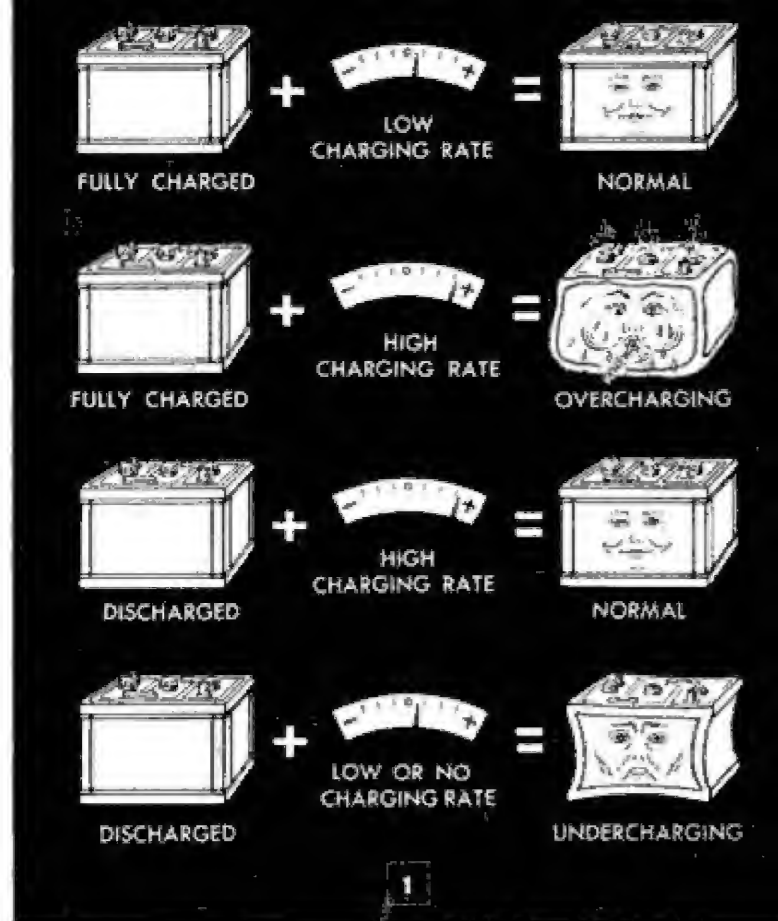
The cutout-relay core and windings are

assembled in a frame, and a flat steel armature is attached to this frame by a flexible hinge so that it is centered just above the end of the core. The armature has one or more contact points, depending on its type, which are located just above a similar number of stationary contact points. When the generator is not operating, the armature contact points are held away from the stationary points by the tension of a flat spring riveted to the side of the armature.

When the generator voltage builds up to a value great enough to charge the battery, the magnetism induced in the relay windings is sufficient to overcome the tension of the armature spring and pull the armature toward the end of the core until the contact points close. This completes the circuit between the generator and the battery. Current then flows from the generator to the battery, passing through the series winding in the proper direction to add to the magnetism holding the armature down and the contact points closed.

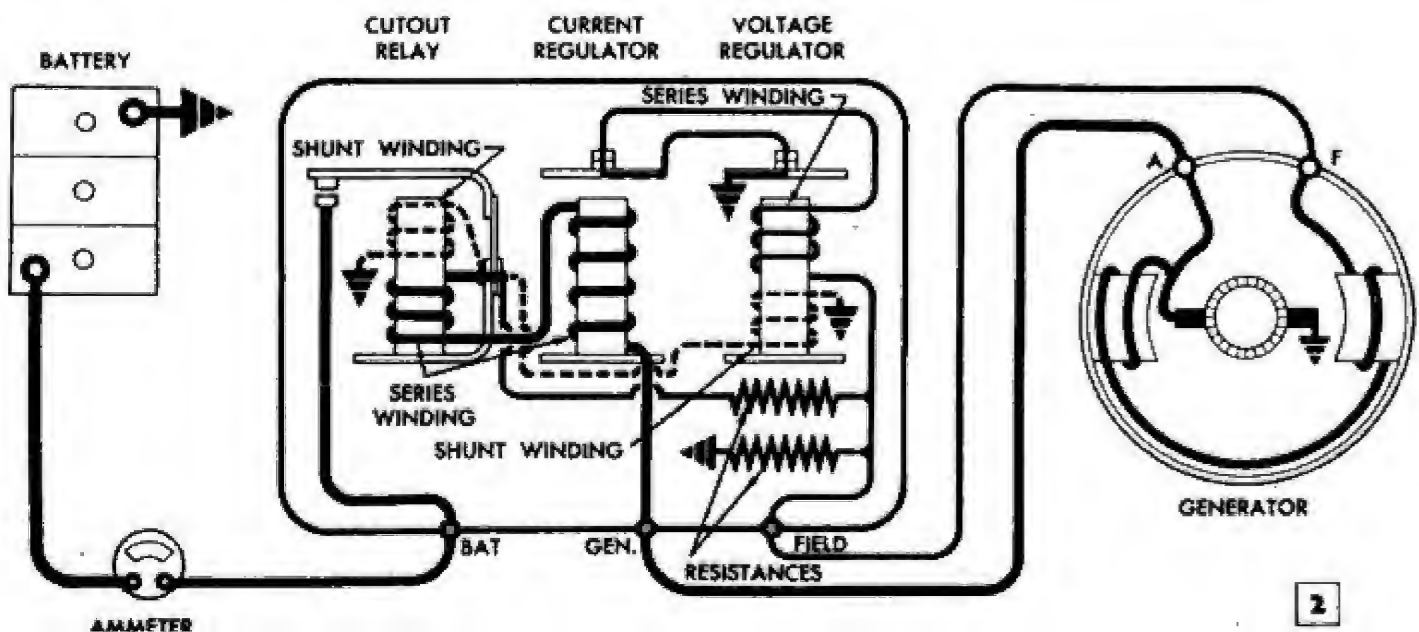
When the generator slows or stops, current begins to flow from the battery toward the generator. This reverses the direction of the current flowing through the series winding, thus reversing the series-winding magnetic field. The magnetic field of the shunt winding, however, does not reverse and the two windings now oppose each other so that the resultant magnetic field becomes insufficient to hold the armature down. The flat spring then pulls the armature away from the end of the core, the points separate and the circuit between the battery and the generator is broken.

The voltage-regulator unit prevents the voltage produced by the generator from becoming too high. It is similar to the cutout relay in that it has two windings on a single core, as shown in Fig. 2. It has a shunt winding consisting of many turns of fine wire (indicated by broken line) and a



series winding of relatively heavy wire (indicated by solid line). The shunt winding is connected across the generator, and the series winding is connected in series with the generator field circuit when the regulator contact points are closed.

The windings and core of the voltage regulator are assembled in a frame similar to that of the cutout relay. A flat steel armature is attached to the frame by a flexible hinge so that it is situated just above the end of the core. The armature carries a contact point which is just beneath a stationary contact point. When the unit is not operating, the tension of a spiral spring holds the armature away from the core so that the points are in contact with each other



and the generator field circuit is completed to ground through them.

When the generator voltage reaches the value for which the voltage regulator is set, the combined magnetic field produced by the shunt and series windings overcomes the armature-spring tension and pulls the armature down, separating the contact points. This action simultaneously opens the series-winding circuit and inserts resistance in the generator field circuit. The increased resistance reduces the strength of the magnetic field in the generator causing the voltage produced by the generator to drop.

Then, as the generator voltage drops, the magnetic field of the shunt winding in the voltage regulator is reduced. The opening of the contact points already has broken the circuit of the series winding and its magnetic field has collapsed completely. As a result, the combined magnetic field of the two windings is weakened enough to allow the spiral spring to pull the armature away from the core and the contact points are closed. This directly grounds the generator field circuit, and the voltage of the generator again begins to climb.

This cycle takes place at a rate of 150 to 250 times per second, limiting the voltage of the generator to a predetermined value. With the voltage thus limited, the generator supplies varying amounts of current to meet the varying states of battery charge

and the changing demands of the car's electrical load.

Despite the protection and control provided by the cutout relay and the voltage regulator, it still would be possible for the generator to damage itself by excessive current output. For example, when the electrical demand is heavy and the battery is in a discharged condition, the current output of the generator can increase without the voltage increasing to a value sufficient to cause the voltage regulator to operate. Consequently, the current output of the generator could continue to rise to a damaging degree.

To prevent this, the current regulator has been added. As shown in Fig. 2, this unit has only one winding, which is a series winding consisting of a few turns of heavy wire. The winding core is in a frame to which a flat steel armature is attached by means of a flexible hinge. As in the case of the voltage regulator the armature is placed just above the end of the core and contains a contact point situated directly below a stationary contact point. When the current regulator is not operating, the armature is held away from the end of the core by the tension of a spiral spring so that the contact points touch each other. In this position, the generator field circuit is completed to ground through the current-regulator contact points, in series with the voltage-regulator contact points.

Photos and information courtesy Delco-Remy Division, General Motors Corp.

Quick Checks of the Charging Circuit

Watch for	Possible Causes	Procedure
Fully charged battery, low charging rate	Normal operation	None required
Fully charged battery, high charging rate	Improper voltage-regulator setting Defective voltage-regulator unit Grounded generator field circuit (in either generator, regulator, or wiring) Poor ground connection at regulator Overheated battery (this will cause battery to accept high charging rate even though voltage-regulator setting is normal)	If battery temperature is O.K., operate generator at medium speed and disconnect lead from "F" terminal of regulator If output remains high, generator field is grounded either in generator or in wiring harness. If output drops to zero, the regulator is at fault and should be checked by a competent automotive electrician Generator output can be checked on the dash-panel ammeter
Low battery, high charging rate	Normal operation	None required unless high charging rate continues after battery reaches full charge
Low battery, low or no charging rate	Loose connections, frayed or damaged wiring Defective battery High circuit resistance Low regulator setting Oxidized regulator contact points Defects in generator	If connections and wiring are O.K., momentarily ground "F" terminal of regulator and increase generator speed. If output rises, the trouble probably is low voltage-regulator setting, oxidized regulator contact points, or open generator field circuit within the regulator If the output remains low, momentarily ground the "F" terminal at the generator. If this causes an increase in output the trouble probably is in the wiring between the regulator and the generator. If the output still is low, the generator is at fault and should be removed for careful checking If no charging rate is obtained, the trouble may be caused by malfunction of the cutout relay, a ground in the armature circuit between the generator and the cutout relay, or by an open field circuit in the generator

3

NOTE: Checks do not apply to Ford electrical system

When the generator current output reaches its rated maximum, which is the value for which the current regulator is set, sufficient magnetism is produced in the regulator winding to pull the armature down and open the contact points. With the points open, resistance is inserted in the generator field circuit so that the generator output is reduced. As soon as the current output starts to fall off, the magnetic field of the current-regulator winding is reduced, the spiral spring pulls the armature upward, the contact points close and again directly connect the generator field to ground. Generator output then increases and the cycle repeats. This cycle takes place 150 to 250 times per second when the current regulator is in operation, preventing the generator from exceeding its rated capacity, and burning itself up.

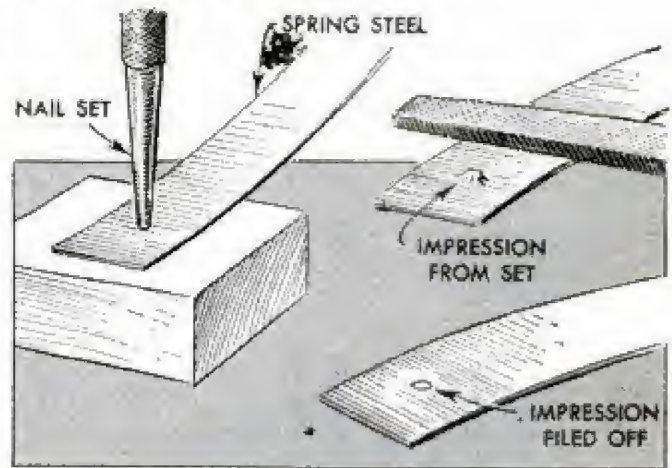
Whenever the electrical load is reduced (electrical devices turned off, or the battery brought up to a full charge) the voltage increases so that the voltage regulator begins to operate and tapers the generator output down. This prevents the current regulator from operating. It is obvious, therefore, that the voltage regulator and the current regulator do not operate at the same time. The flexible hinge which attaches the armature to the frame in each of the three units is a bimetal piece which compensates for temperature changes.

The average motorist can detect possible trouble in the charging circuit by maintaining a careful record of the state of charge of his car's battery and by watching the action of the ammeter on the dash panel. How the ammeter indicates trouble in the circuit is illustrated in Fig. 1. If abnormal operation is suspected, the quick-check procedure given in Fig. 3 can be followed to locate the source of trouble without using special equipment. Specialized equipment not usually found in the home workshop is required for proper regulator testing and adjustment.

After reconnecting any of the wiring in the charging circuit, repolarize the generator before starting the engine. After reconnecting leads, momentarily connect a jumper lead between the "Gen" and "Bat" terminals of the regulator. This allows a surge of current to flow through the generator, thus repolarizing it.

As temperature has a positive effect on the voltage required to charge a battery, it also must be considered in selecting the setting of the regulator. Where an auto is operated regularly in unusually high temperatures, it often is advisable to maintain a lower-than-normal regulator setting to prevent overcharge. Conversely, higher settings usually are required for regulators operated in extremely cold climates.

Hole Made in Flat Spring With Nail Set



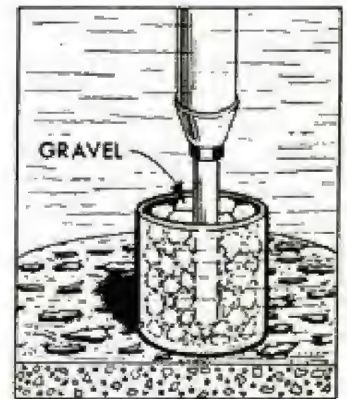
If you have occasion to make a small hole in a piece of clock spring or spring metal of similar thickness, an easy way of doing the job is to use a nail set. Place the spring on top of a hardwood block and use the nail set to dent the spring as much as possible. After this has been done, merely turn the spring over and file through the raised portion. The nail set can then be used as a "reamer" to true the hole if necessary.

Hugh Lineback, Stillwater, Okla.

Filter for Cistern Pump

To prevent leaves and other debris that might enter his cistern from clogging the pump-cylinder valves, one homeowner improvised a filter to fit over the end of the pump intake pipe as shown.

The filter consisted of a discarded gallon can with its top removed, filled with coarse gravel or crushed stone. If the latter is used, a screen should be placed over the end of the pipe to

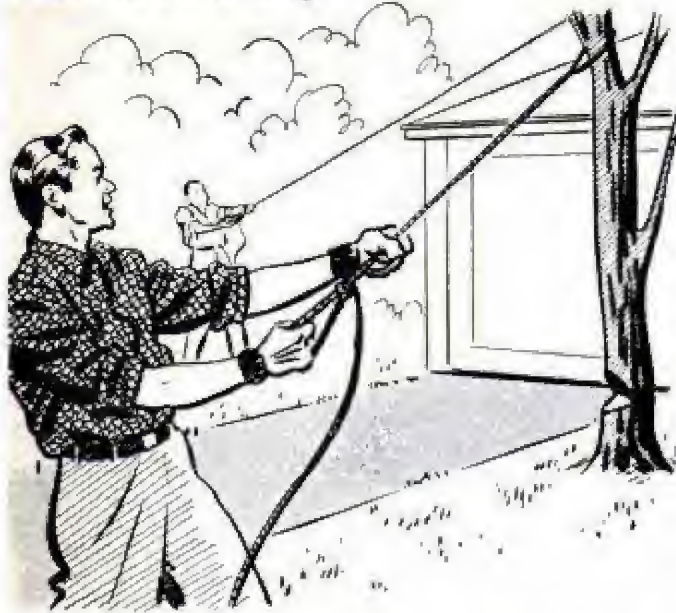


prevent the stone from being drawn into the pipe. Painting the can, or preferably, the use of a galvanized, copper or aluminum can, will give the most service insofar as resisting rust.

Square Serves as Marking Gauge

A combination square becomes a handy marking gauge if a small notch is filed in one end of the straight edge. To mark a board for ripping, set the square to the desired length and slide the head of the square along the edge of the board, holding the pencil point in the notch.

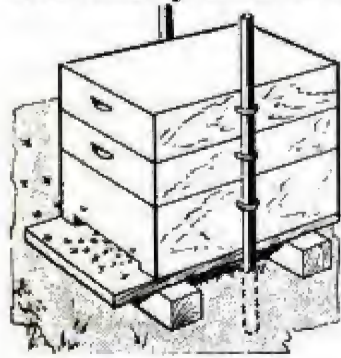
Loops Tied in Long Rope Provide Sure Grip



When pulling on a long rope, such as one used in guying a tree that is being felled, you will be able to maintain a surer, more powerful hold by knotting one or more loops in the rope where you grip it. You may grasp the loop normally or loop it about the hand at the wrist and grip it at the knot for the surest hold. Several loops, spaced at intervals suitable for accommodating additional men, could be provided for extra pulling power if needed.

Joseph Miles, Denver, Colo.

Superhives Anchored on Steel Rods Are Easily Removed and Replaced



When supers are added to a beehive to accommodate a heavy flow of honey, the possibility of their being blown off by the wind can be eliminated by using two steel rods as anchors. The

rods are inserted through screw eyes driven into the sides of the hive and each super. Then the rods are pushed into the ground. This permits the addition or removal of supers by simply sliding them on or off the tops of the rods.

Wrench Kept Near Shutoff Valve For Emergency Use

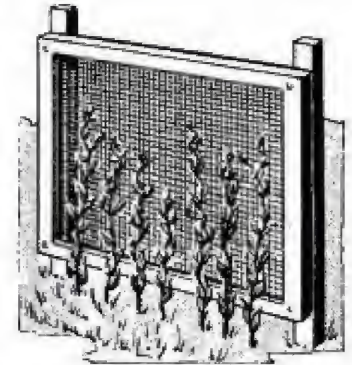
Kept near the shutoff valve of the gas meter in your house, a wrench will always be close at hand for shutting off the gas supply quickly in case of fire or other emergency. A discarded open-end wrench or an

adjustable wrench that has been set at the proper adjustment can be hung near the valve. Give the wrench a coat of bright paint or a coat of luminous paint to make it easier to locate in a dimly lighted room.

Hugh R. Fullagar, Chino, Calif.

Old Window or Door Screen Used as Flower Trellis

If you have a discarded window or door screen, it can be used as a trellis for sweet peas, morning-glories or other vine-type flowers. Just nail two stakes to the screen and anchor it as illustrated.



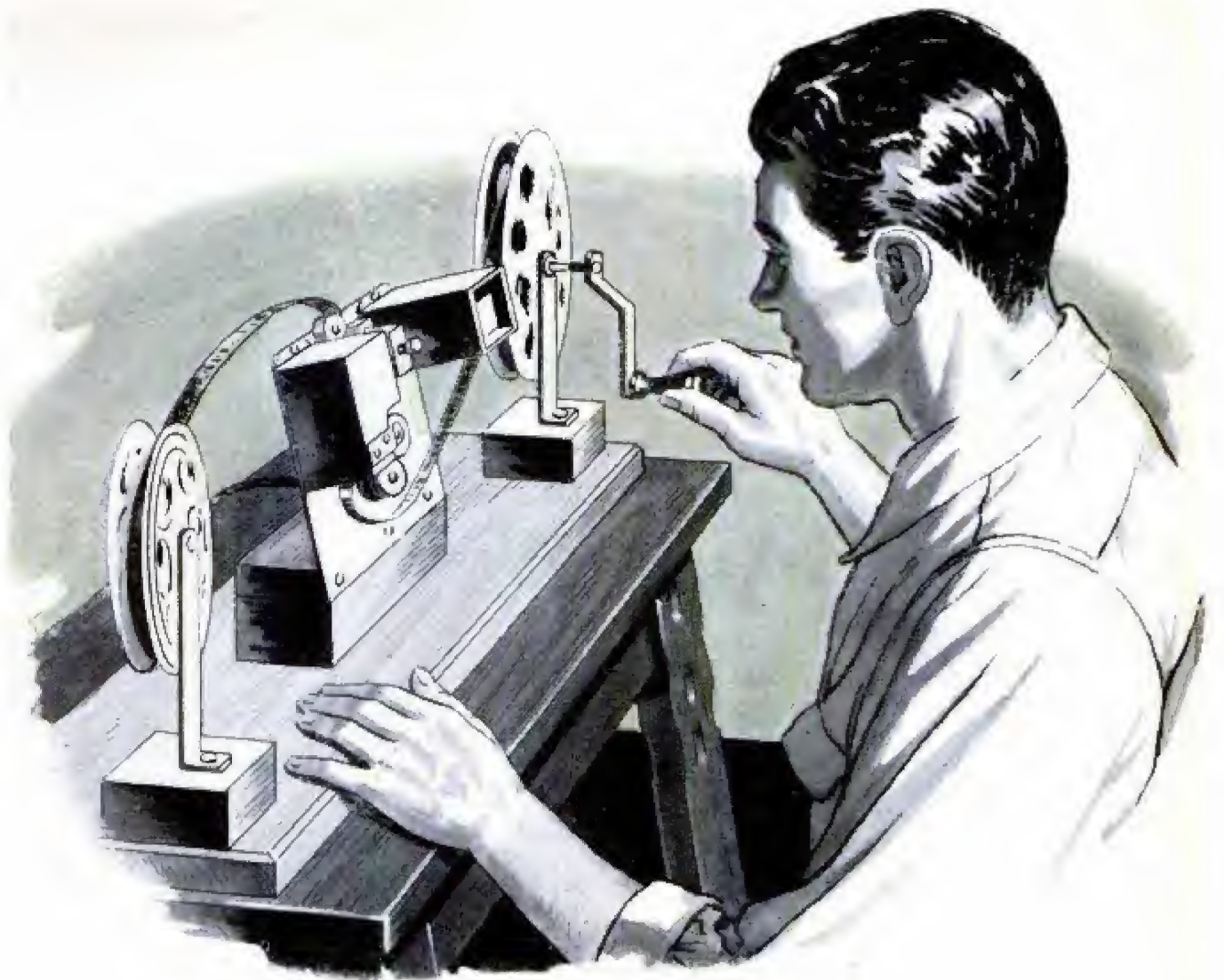
The vines of the flowers will attach themselves to the screen wire strongly enough to avoid being blown down by an ordinary windstorm.

Cutting Tape Into Narrow Strips



Cellulose or photo tape may be cut into very narrow strips by pressing a wide strip on a sheet of glass and cutting it into strips of the desired width with a safety-razor blade. Use a straightedge, such as a ruler, to guide the blade. The tape strips are peeled off the glass as needed. The glass surface will not in any way interfere or damage the adhesive on the tape. If material other than glass is used, the possibility of damaging the adhesive will be greater.

John J. Rea, Urbana, Ill.



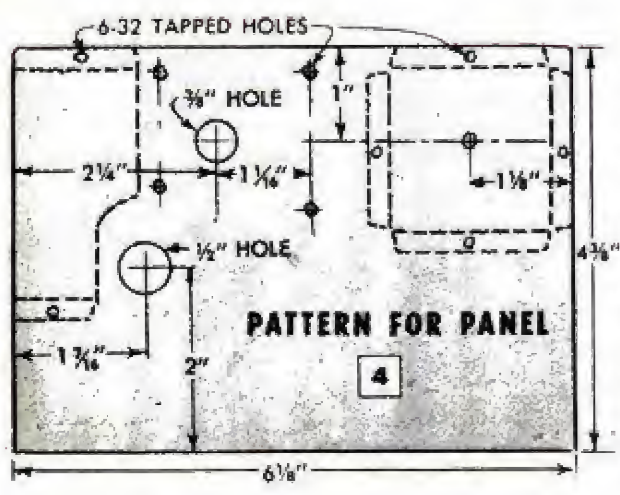
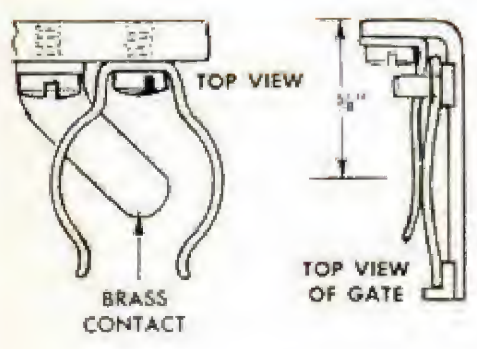
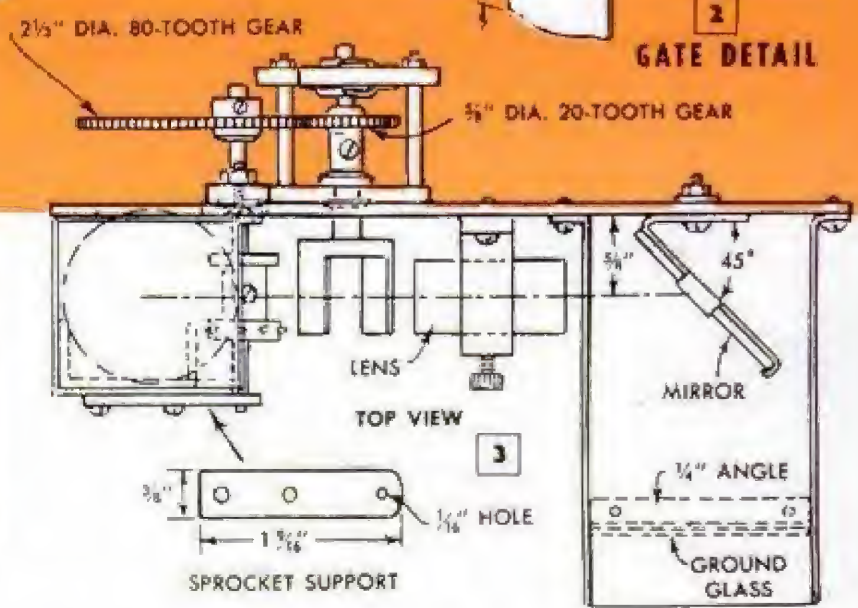
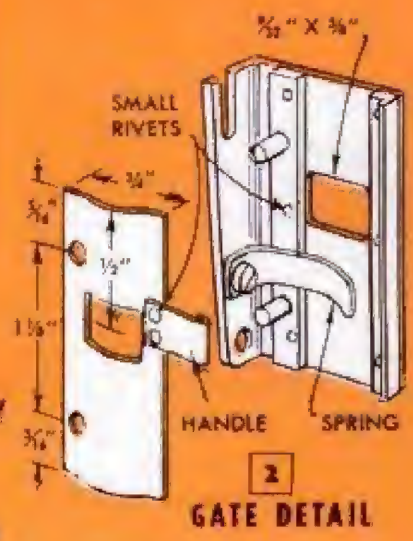
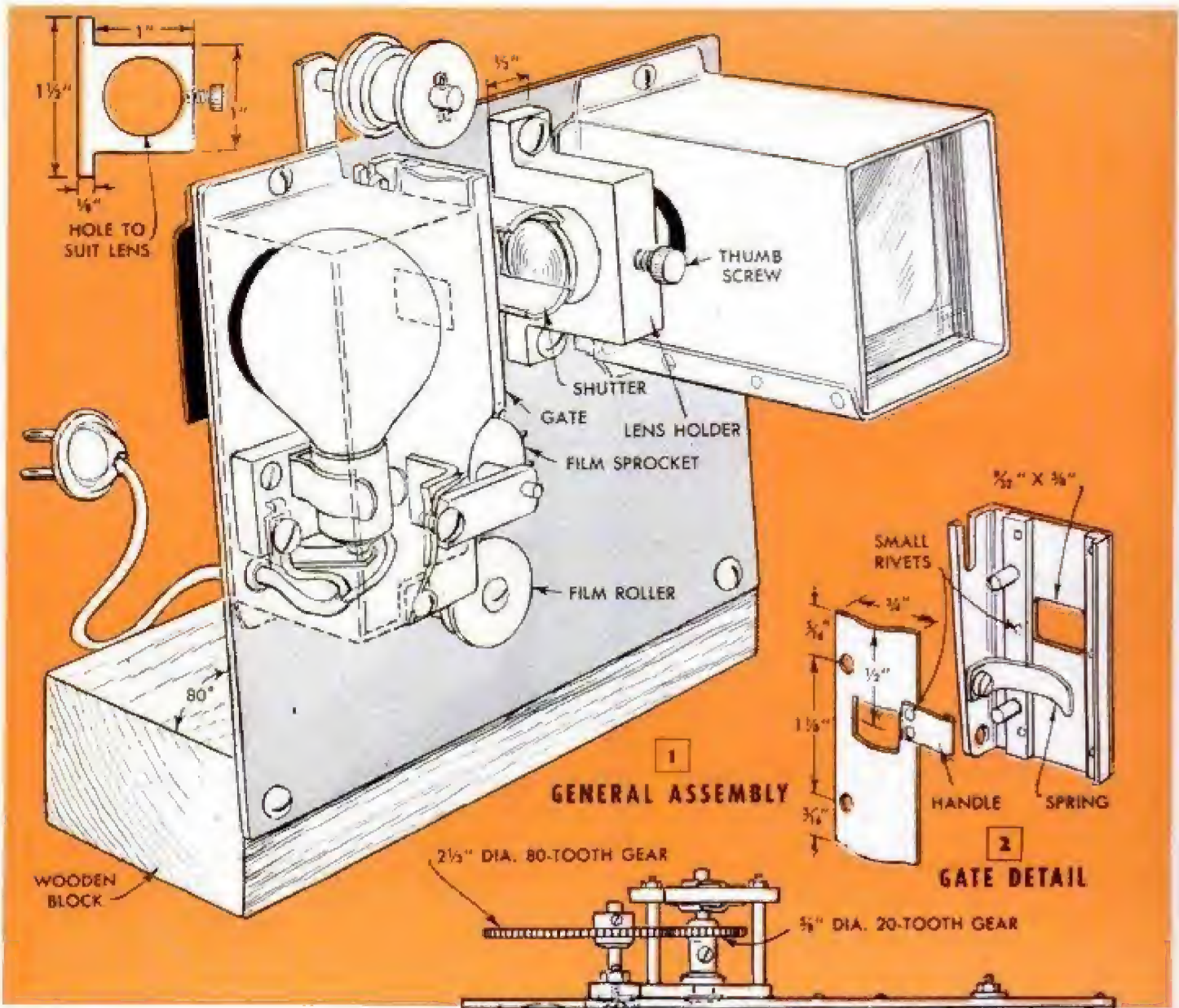
By Owen Wilson

SIMILAR IN operation to your movie projector, except that it is operated manually, this inexpensive 16-mm. viewer permits you to preview your home movies in continuous action on a small hooded screen. When used in conjunction with a regular film splicer, the unit provides a most convenient setup for editing. The original viewer was made for less than five dollars which included the cost of the lens and shutter. Spare parts from a discarded projector will further lessen the cost. Other than lens and shutter, the viewer is made for the most part of odds and ends.

Fig. 1 shows a general assembly drawing of the viewer itself. The spool rewinds may be purchased or improvised as shown. The first step is to cut and drill the panel according to Fig. 4. While sheet aluminum, $\frac{1}{16}$ in. thick, was used for the original panel, any sheet metal will do. To provide a more convenient viewing angle, the panel is fastened to a wooden block, the edge of which is beveled to tilt the panel 10 or 15 deg. It is important that the main parts of the viewer,

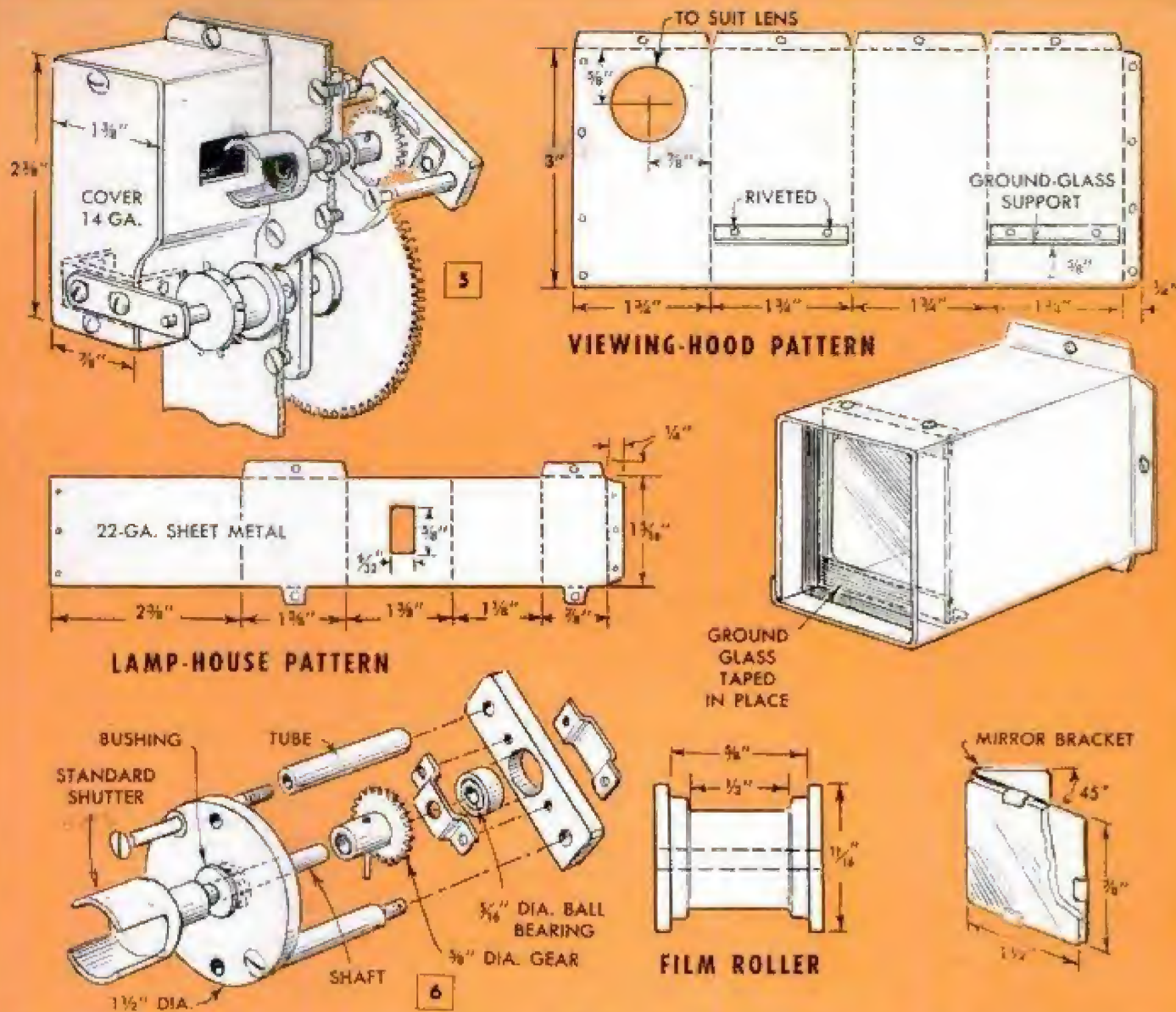
which include the lamp house, film gate, shutter, lens and viewing hood, be centered on a horizontal line 1 in. down from the top of the panel. The same is true in locating the parts out from the panel, all must be on a line $\frac{5}{8}$ in. from the panel as indicated in the top view, Fig. 3.

Patterns for both the lamp house and the viewing hood are given in the details accompanying Fig. 5. Each is provided with tabs for mounting, and tiny rivets are used in joining the seams. The lamp house is designed to accommodate a standard 115-v. round-type projector bulb, and by studying Fig. 1 and the detail above Fig. 4 you can see how the friction-type socket is made. The two parts of the socket are mounted on a fiber block to insulate them from the panel, the thickness of the block being sufficient to bring the center of the bulb $\frac{5}{8}$ in. out from the panel. Note in Fig. 1 that a hole is cut in the panel opposite the bulb and backed up with a baffle to vent the lamp house. Rollers for guiding the film are mounted above and below the gate, the lower one being mounted on a spindle attached directly to the panel, while the



upper one is held by a stand-off bracket. The film gate detailed in Fig. 2 may be taken from an old projector or formed from brass. The top-view detail of the gate shown above Fig. 4, indicates how the flat spring of the gate holds the pressure plate against the film. The gate is mounted on the panel so that the windows in it and the lamp house are in alignment.

The sprocket and shutter mechanisms are detailed in Figs. 3 and 5. Note how they are placed in relation to each other to engage the gears properly. Here again, both the sprocket and the shutter must be mounted



so that they are centered on a line $\frac{5}{8}$ in. from the panel. A pull-apart view of the shutter mechanism, Fig. 6, clearly indicates how it is supported on the rear of the panel while Fig. 5 shows how the outboard end of the film sprocket is held by an arm which is fastened to the cover of the lamp house. The shutter rotates at a gear ratio of 4 to 1 between itself and the eight-frame sprocket. Both shutter and sprocket mechanisms should be adjusted to rotate freely.

The lens holder is cut to the shape indicated in the detail above Fig. 1. This is bored to suit the lens used and is fitted with a thumb screw to lock the lens in position

when in sharp focus. The image is transmitted to the viewing screen by a small mirror placed at a 45-deg. angle inside the viewing hood. This is pictured clearly in Fig. 3 and the detail to the extreme right of Fig. 6 shows how tabs on the mirror bracket are used to clamp the glass in place.

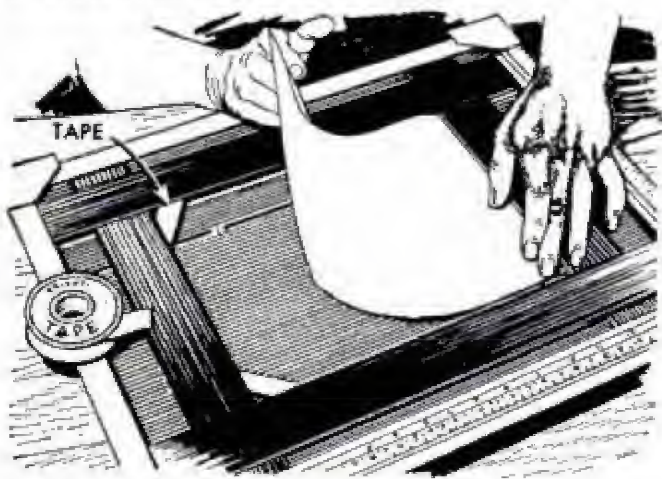
The reel support located to the left of the viewer should be a rewind type. The other support should be a take-up type having a 1 to 1 ratio and fitted with a long crank taken from a discarded can opener or like object because if a gear-type rewind is used to pull the film through the viewer, it will be difficult to control the speed.

Negatives Dried Quickly in Solution of Alcohol and Water

Here's one way to dry negatives in a hurry that requires little more than a large jar and a supply of denatured alcohol to do the job. First obtain a jar having an opening large enough to accommodate the largest of the negatives without a need for bending them when inserted. Partly fill the jar with alcohol and add water amount-

ing in quantity to 10 percent of the volume of the alcohol. After washing the negatives, dip them into the solution and remove the surplus afterward with a small squeegee or a clean windshield-wiper blade. If your enlarger does not overheat rapidly, you may then print the negatives immediately using a short exposure.

Tape Holds Paper Flat on Easel When Making Borderless Prints



When making borderless prints, the use of tacks or clamps to hold printing paper flat on an enlarger easel usually leaves marks which must be retouched on the print. To avoid this trouble, one photographer sticks strips of adhesive tape to the underside of the masking bands as in the

drawing. The mask is adjusted slightly larger than the over-all size of the print and the tape is pressed, adhesive side up, across the corners formed by the bands. This provides an adhesive surface at each of the four corners to hold the paper flat when placed on the easel.

Virginia Hanson, Los Angeles, Calif.

Negatives Protected in Developer By Use of Alternate Slots in Tank

To prevent thin film-pack negatives from buckling and coming in contact inside developing tanks designed to hold a dozen films, try loading only six negatives at a time in alternate slots. This will permit the processing chemicals to circulate freely, producing clean negatives free of blank spots that result when the films stick together.

Robert Hertzberg, Jackson Heights, N. Y.

☐ Having no range finder on his camera, one photographer marked off a scale in feet on the strap of the camera case and used it to check distances before shooting.

Popular Mechanics Bookshop

Don't Slam the Door . . .

But it's time to go outdoors. Time for dressing up the garden; time, maybe, to start building a home of your own. Time to think of a fishing trip and, before you go, time to "get out and get under" the old family auto for a spring checkup. And for all these spring activities we have four books written by experts to help make you an expert.

Let's Talk About Fishing First . . .

A fish seems to recognize a man who has read *How to Tempt a Fish*, published by *Popular Mechanics*. It gets that resigned look on its face and swims right up to his hook and takes a firm grip. Might as well, for anyone who has read that book is an expert, or well on his way. Packed between the covers of this beautifully illustrated guidebook for anglers are detailed instructions for fly fishing, bait casting and salt-water fishing. Joe Godfrey, Jr., the author, has a lifetime of experience in fishing and hunting all over America; he is the founder and executive secretary of the Sportsman's Club of America and founder of the Fishing Hall of Fame. He tells you how to choose the best rod, reel, line and lure, and how to handle them. You'll enjoy page after page of full-color photographs. We think this is the best book ever written for fishermen. And it's just \$2.00 a copy from *Popular Mechanics Press*, 204 East Ontario Street, Chicago 11.

Fishing may come first in your mind, but

the wise fisherman gets his spadework done first on his lawn and garden. You can get a head start on this year's yard problems by reading one of our best sellers, *How to Grow the Best Lawn and Garden in Your Neighborhood* (\$2.50, PM Book Dept.). It's a complete handbook for the home gardener, with chapters on lawn planting and care, flower and shrub arrangement, analysis of soil problems, trees, how to fight insects, diseases and weeds, and many other topics. Expert or novice, you shouldn't be without this guide to better gardening.

Modern automobiles present more complicated problems every year for the car owner, yet you can save hundreds of dollars in maintenance and repair bills by doing the work yourself. But don't fumble the job! Follow the detailed advice and work charts on battery and tire care, clutch repair, the servicing of brakes and generator regulator, motor tune-up and scores of other home repair operations in our *Motorist's Fix-It Book*, \$2.50 from the *Popular Mechanics Book Department*, 204 East Ontario Street, Chicago 11.

One of the least expensive, most substantial houses you can build for yourself is the concrete block house. Hundreds of these houses have been built from *Popular Mechanics'* blueprints and book, *Concrete Block House*. Materials cost less than \$3650. Order the book (\$2.00), the complete blueprints (\$12.00), or blueprints and book together for \$12.50 from *Popular Mechanics Press*, 204 East Ontario Street, Chicago, 11.

All books available from *Popular Mechanics Book Dept.*, 204 East Ontario Street, Chicago 11



SHOP NOTES

Keep Your JOINTER Sharp!

Razor-sharp jointer blades make feeding easier, produce smooth, clean work to precise dimensions

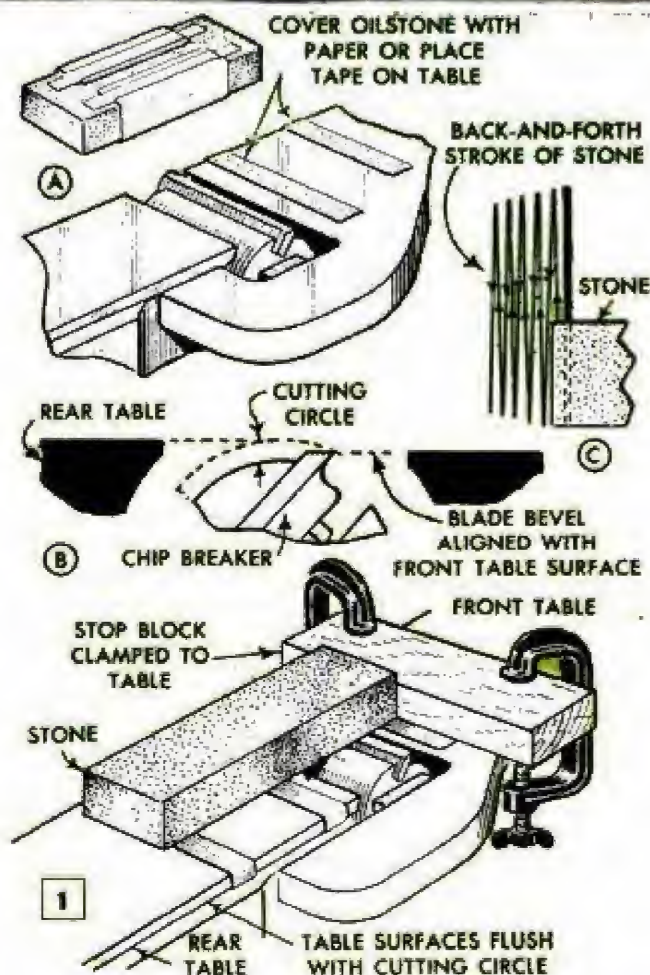
By E. R. Haan

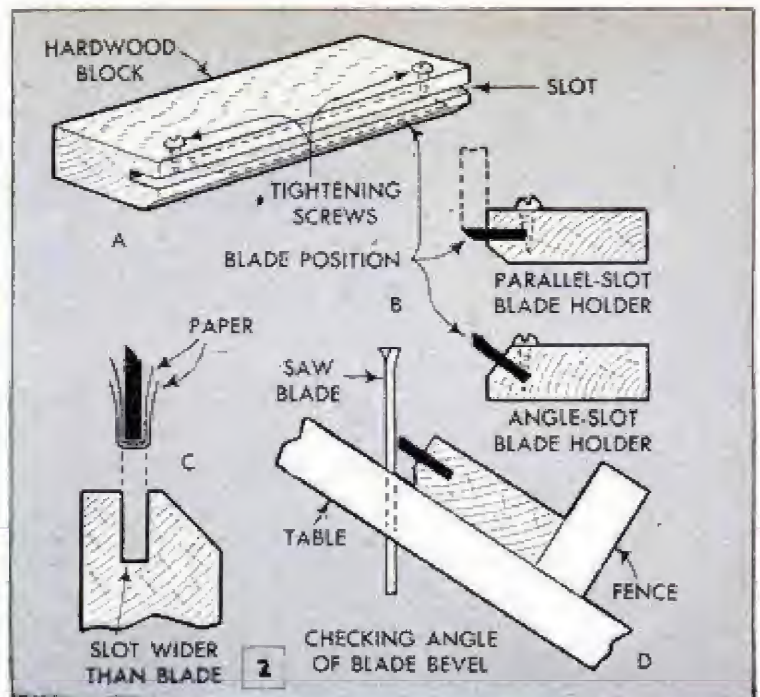


BY REGULARLY observing a few simple precautions you can keep your jointer cutting smoothly over a much longer period of time between sharpenings. Always brush abrasive dust and grime from the stock to be planed, using a wire brush. Don't plane wood on which there are traces of plaster or cement, or grains of sand and check used stock carefully to remove any embedded particles of metal.

Hand honing: When jointer blades have lost their keen edges they can be restored without removing from the head by hand honing the edges with a fine oilstone as in detail A, Fig. 1. Wrap a single thickness of heavy paper around the oilstone and tape it in place as shown or place two strips of masking tape across the table as indicated. Then lower the front table so that its surface lines up with the blade bevel. Wedge the jointer head firmly in this position and stroke the stone over the cutting edge in a uniform back-and-forth motion as in detail C, Fig. 1. Give each blade the same number of strokes. Continue the procedure until the blades are uniformly sharp.

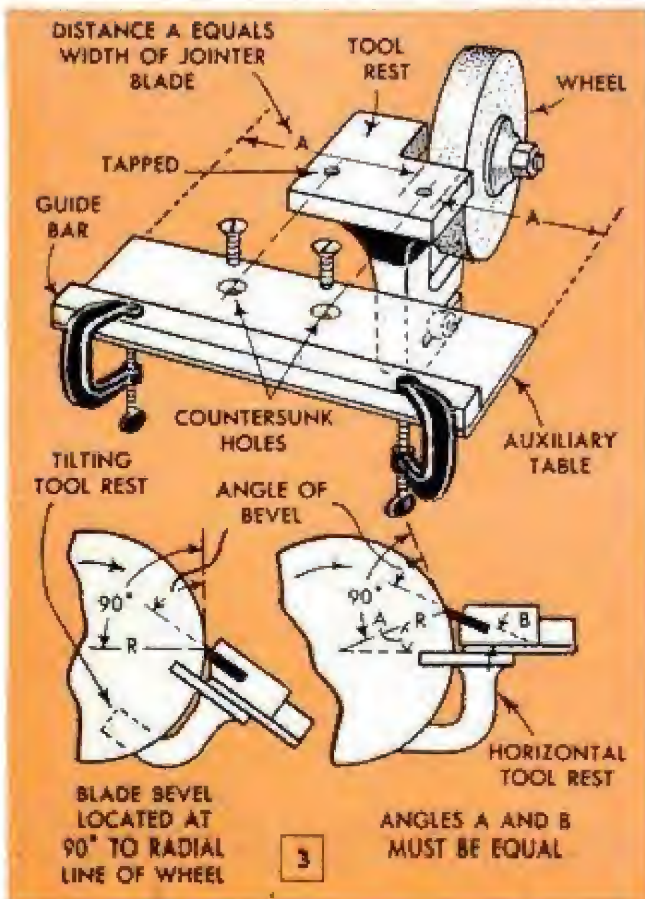
Power honing: Another method of honing, frequently used in woodworking shops, is to hone the blades while the machine is





running. Make the setup as in the lower detail, Fig. 1, but raise both tables to the highest point of the cutting arc. Use paper on the stone or tape on the table, as before, to protect the machined surfaces. Then start the machine and lower both tables uniformly until the stone contacts the cutting edges lightly. Move the stone back and forth in a full stroke two or three times, then stop the machine and examine the cutting edges carefully. The new bevel formed by honing should not be more than $\frac{1}{32}$ in. wide as otherwise the rear edge of the new bevel may strike the stock.

Grinding: After the blades have been honed once or twice and have again become dulled by use, they should be sharpened by grinding. Remove the blades from the cutterhead, as shown in the upper left-hand photo, and then make a hardwood holder of either type shown in details A and B, Fig. 2. The holder having the slot parallel to the sides as in detail A is the one to use when the grinder tool rest can be set at the required grinding angle. Otherwise the blade slot must be cut at the required grinding angle. Clamp screws driven into the wood across the slot hold the blade firmly in place while grinding. If necessary, wedge the blades in place with folded strips of paper as in detail C, Fig. 2. One simple method of determining the correct grinding angle is to place the blade and holder against the ripping fence of the circular saw as in detail D, Fig. 2. Tilt the saw table or the arbor until the blade bevel is flush with the side of the saw blade. The correct grinding angle then can be read on the tilt scale. One simple setup for grinding jointer blades on an ordinary bench grinder having a tilting tool rest is detailed in Fig. 3. As most bench grinders have only a small tool

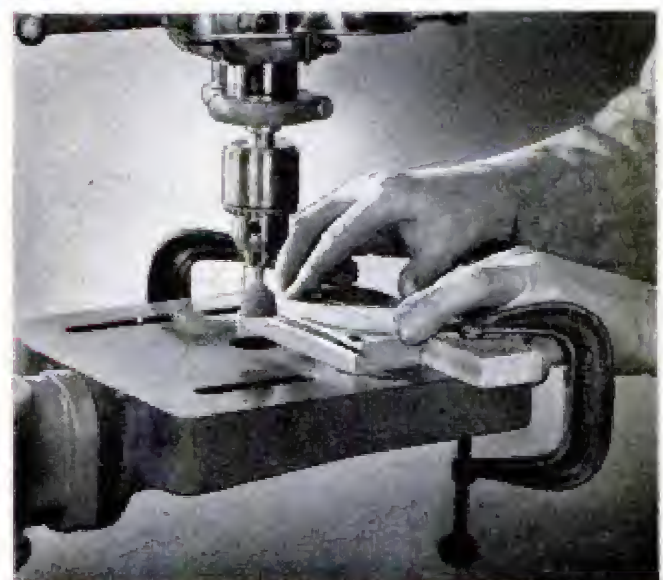
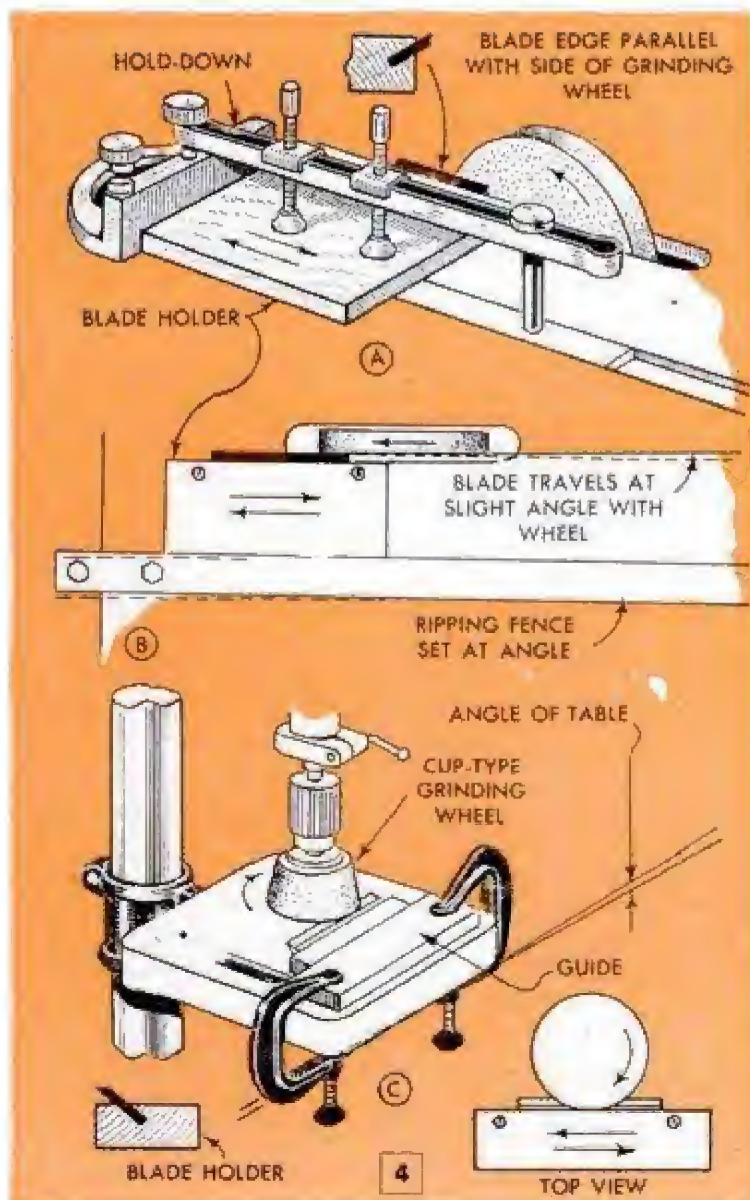


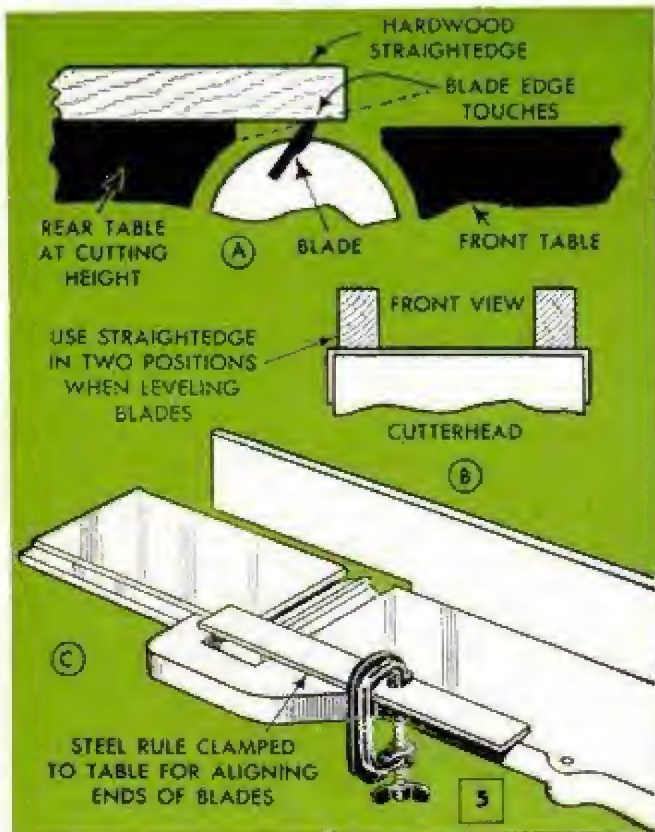
rest it is necessary to provide an auxiliary table of sufficient size to support the blade holder and permit it to be moved right and left a distance equal to the width of the blade. Drill and tap the tool rest for $\frac{1}{4}$ -in. cap screws and, after attaching the auxiliary table, clamp a guide bar or strip to its lower edge. An important point in connection with grinding is the location of the bevel of the blade in relation to the radial line of the grinding wheel. Note in the two lower details in Fig. 3 that the radial angles must be equal when either the horizontal or tilting-type tool rest is used. It is best to use a 6-in.-dia. grinding wheel as otherwise the blades will be hollow-ground more than is permissible. When grinding, keep the blade moving slowly in a uniform stroke to right and left, and dip it in lukewarm water at regular intervals to prevent overheating. To obtain a slight feed for each succeeding stroke, insert a strip of paper between the blade holder and the guide bar. Be sure to use the same number of strips for each blade.

Grinding on circular saw: If you don't have a bench grinder, you can set up the

circular saw to grind jointer blades as in Fig. 4, details A and B. If you use the straight-blade holder, the saw table or the arbor must be tilted as in the upper photo at the right of Fig. 4. With the angle holder use the setup shown in detail A or B, Fig. 4. Note that when the ripping fence is used as a guide, detail B, it must be set at a slight angle to the side of the grinding wheel.

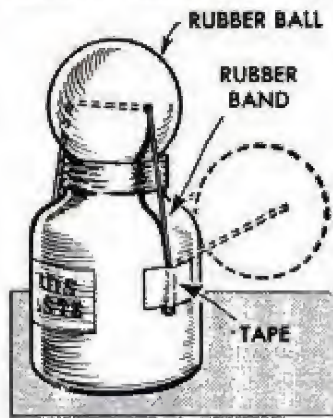
Grinding on drill press: When fitted with a cup-type grinding wheel the drill press can be utilized for sharpening jointer blades. The setup is quite simple and accurate, the blade holder being slotted at an angle with the face of the stock as in the sectional view, detail C, Fig. 4. Note that the drill-press table is tilted at a slight angle so that only the edge of the wheel contacts the jointer blade. In this case the blade is moved from left to right only. After one pass under the wheel the holder is lifted from the table and returned to the original position at the left of the grinding wheel. Before making the first pass of the blade be sure that the drill-press quill is locked firmly in position so that it just contacts the face of the beveled edge of the blade.





Remounting blades in cutter head: Before replacing the blades, be sure to remove the burr from the edge by drawing the flat side of the blade over a slipstone as in the upper left-hand photo. Some woodworkers, requiring exceptionally fine work, hone the cutting edges after grinding. This is done freehand, using a hard slipstone, and care must be taken not to round the bevel or turn the cutting edge. In replacing the blades in the cutterhead, first set the rear table at the normal cutting height and clamp a steel rule or metal straightedge to the front table as in detail C, Fig. 5, to provide a stop for aligning the blades endwise. Now place the blade in the cutterhead slot, replace the locking bar with the concave edge up and tighten the locking screws sufficiently to hold the blade in place. Be sure that one end of the blade contacts the straightedge lightly. Cut a hardwood straightedge and hold it near one edge of the rear machine table as in the center photo at the left. Raise the end of the blade until the cutting edge touches the straightedge as in detail A, Fig. 5. Place the straightedge at the opposite side of the table and raise the cutting edge to contact. Tighten the locking screws slightly to hold the adjustment. Now, turn the cutterhead slowly by hand to check the setting. If correct, the cutting edges will just touch the straightedge but will not lift it or move it forward as the head is rotated slowly by hand. Set the remaining blades, using the same procedure, and check the adjustment of all three before the final tightening of the locking screws. After tightening the screws, check again to make sure that the setting remains the same. This final setting of the blades is of the greatest importance in obtaining satisfactory operation of the machine. If one blade is lower or higher than the others, either at one or both ends, the machine not only will produce rough work but may vibrate badly due to the unbalanced cutterhead. It also is important to tighten the locking screws to a uniform tension. This assures preservation of the original adjustment and safety for the operator as well. Another good idea is to check the tension of the screws after operating the machine for a short time. As the final step, it may be necessary to reset the pointer on the depth scale. To do this, run a cut to exactly $\frac{1}{8}$ -in. depth then set the pointer to this reading. On some jointers, the ends of the blades are beveled and ground to a cutting edge for making rabbet cuts. Unless considerable rabbeting is done, it will not be necessary to sharpen these cutting edges each time the blades are sharpened. When necessary to sharpen the edges, grind and hone them freehand but be sure to preserve the clearance angle.

Quick-Acting Stopper for a Jar

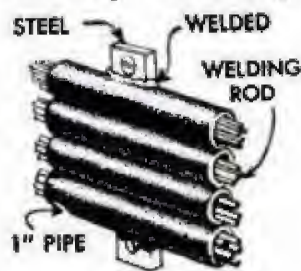


One shipping clerk fitted the top of a paste jar with a stopper improvised from a rubber ball to eliminate the necessity of unscrewing and replacing the metal cap each time the paste is used. A strong rubber band was cut and passed through the

ball after which the ends were taped to the sides of the jar. The band, which permits the ball to be rolled off and on the jar opening easily, should be under sufficient tension, nevertheless, to hold the ball securely in the opening in order to preserve the paste when the jar is not in use.

G. E. Hendrickson, Argyle, Wis.

Handy Welding-Rod Rack



Four lengths of 1-in. pipe welded side-by-side to a short length of flat steel make a handy rack for storing various sizes of welding rods. The rack is attached to the weld-

ing bench in any convenient position with bolts or by tack-welding. Some welders, using this type of rack, prefer to close one end of each length of pipe with a small metal disk and then weld the holders to the vertical support at an angle of about 45 deg. with the open ends up.

Roland Cueva, Los Angeles, Calif.

Working Plastics on Bench Lathe Aided by Oiling Cutting Tools

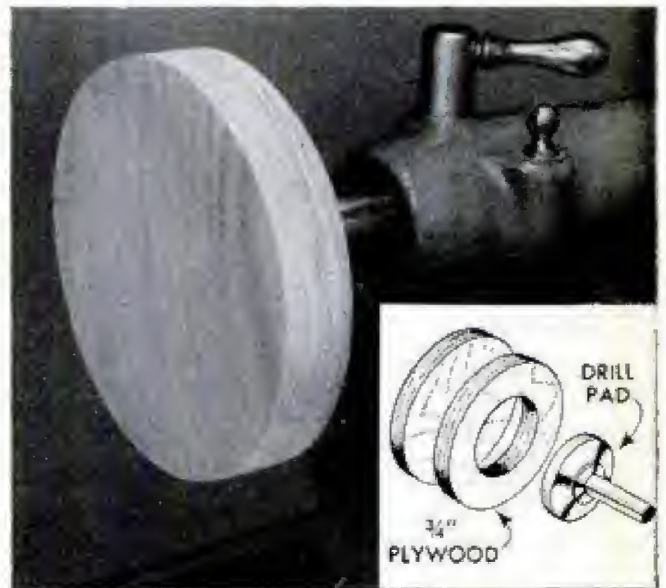
When machining plastics on a woodworking lathe, you can save considerable time and trouble by applying a nonalkaline lubricant or coolant to turning chisels, drill bits and taps. Apply lubricant before starting the work and from time to time during any of the operations. The oil prevents the plastic from heating, due to excessive friction at the dead center, and also helps prevent shavings from accumulating and piling up on the tool. For grinding and buffing the work on the lathe, fine steel wool that has been soaked with oil—about S.A.E. 30 weight—can be used effectively in place of sandpaper for accomplishing the preliminary smoothing operation.

Robert H. Harwood, San Diego, Calif.



Holder for Typist's Notebook

An inexpensive holder for a typist's notebook may be made by bending a piece of sheet metal to the shape indicated. Paint the holder to improve its appearance or make it from a sheet-metal bookend.



Cap Made From Plywood Disks Protects Drill Pad

Instead of using a makeshift backing to protect a lathe-tailstock drill pad against possible damage from the drill point, try a wooden cap like this one. It will not slip out of place and will "stay put" even when the pad is removed from the lathe. It consists of two disks of plywood, one of which is cut out in the center to slip snugly over the drill pad. The disks are glued together and should be about 1½ in. larger in diameter than the pad. Once in place, the pressure from the drilling will keep it in position.—Richard Hanscom, Elmhurst, Ill.

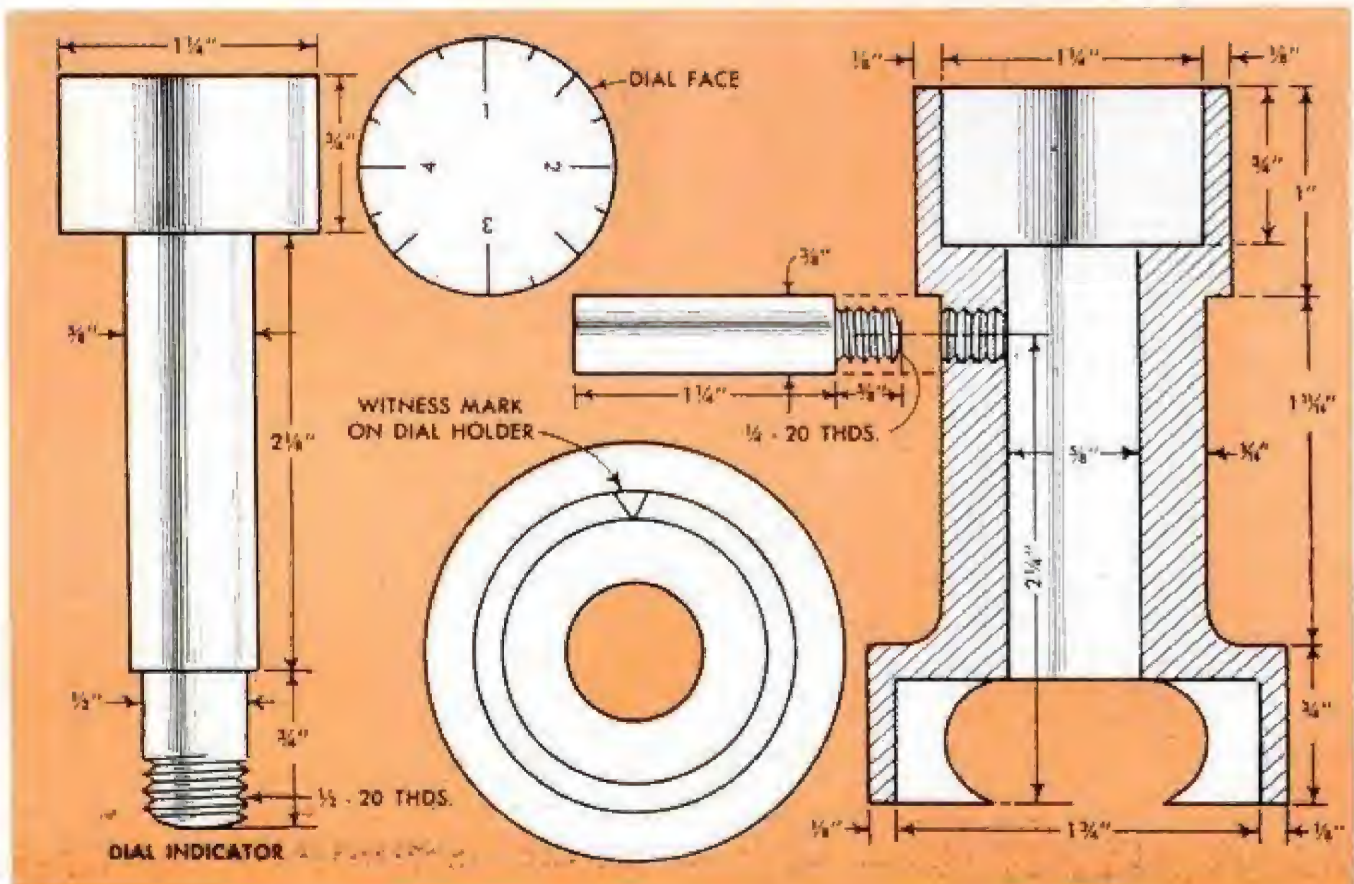
THREAD DIAL INDICATOR and CROSS-SLIDE STOP

By C. W. Woodson



OWNERS OF SMALL metalworking lathes who like to make their own accessory equipment will find the construction of these accessories a satisfying challenge to skill in lathe operation. Both units are excellent training projects for advanced students in the school machine shop as the construction involves basic machining operations such as facing, shouldering, indexing, boring, milling and thread cutting. Only the fractional dimensions are given in the details, but in good work on projects of this type, dimensions of the moving parts usually are held plus or minus .002 in.

The purpose of the dial indicator is to permit the threading tool to be withdrawn from the work while the lathe carriage is disengaged from the lead screw and returned to its original position by hand, eliminating the slow return of the carriage by means of the lead screw. After the carriage has been returned to the starting position, the dial indicator will show precisely when to re-engage the carriage with the lead screw so that the cutting tool will enter the thread accurately for the next cut. The cross-slide stop clamps to the carriage dovetail and, while it permits the threading tool to clear the work, it can be set to limit the depth of cut. Usually the slide is tapped for the



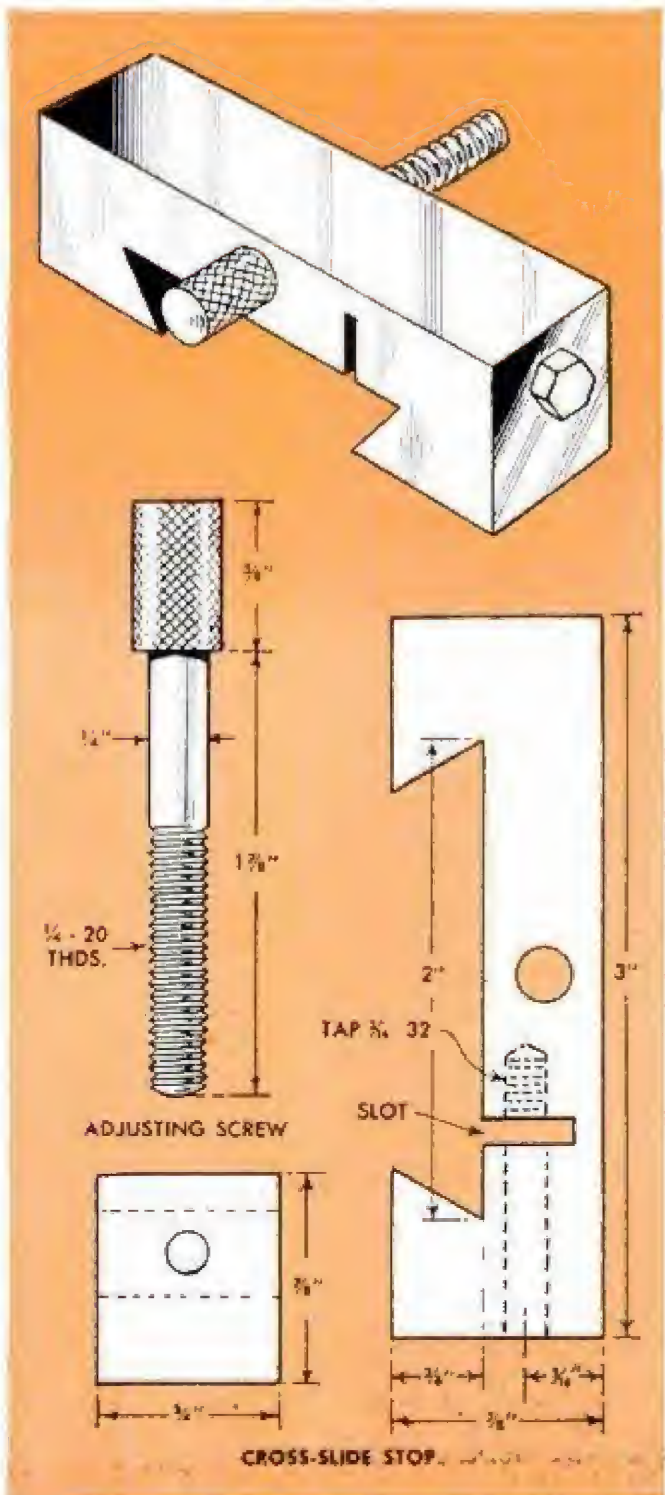


Dial indicator and slide stop speed up accurate thread cutting in lathe. Note position of the parts

adjusting screw but the size of the thread may vary on different lathes. It's a good idea to check the thread before making the screw.

The body of the indicator is a comparatively simple turn-and-bore job in 2-in. cold-rolled stock. Face off to length, then drill and ream for the dial shaft and bore the recesses for the dial and driving gear. Machine the outside all over and break the corners $\frac{1}{32}$ in. Drill and tap for the supporting arm but be sure that the hole is correctly located beforehand. Nearly all lathe carriages are drilled for a dial indicator however the location of the hole with relation to the lead screw may vary. Note in the body detail on the opposite page that the flange at the lower bell end of the body is cut through to form an opening for the driving gear. The opening can be cut roughly with a narrow hacksaw blade and then finished with a round-faced grinding wheel. The dial and its shouldered shaft are turned and threaded from one piece of stock, and the shaft and edge of the dial are ground to final fit. Index the face of the dial in the lathe and mark the divisions with a sharp lathe tool. Number the 90-deg. divisions as indicated. File or stamp a witness mark on what will be the rear edge of the dial housing when it is in position on the lathe. Assemble the dial and shaft with a 32-tooth helical gear fitted to the lower end and held in place with a hex nut.

The dovetail in the body of the cross-slide stop is cut with a lathe milling attachment. The body is then finish-ground all over and drilled, slotted and tapped as indicated. Don't forget to check dimensions carefully before cutting stock as those given in the detail may not agree with those of the lathe at hand. In the photo above, the two units are shown in place on the lathe.

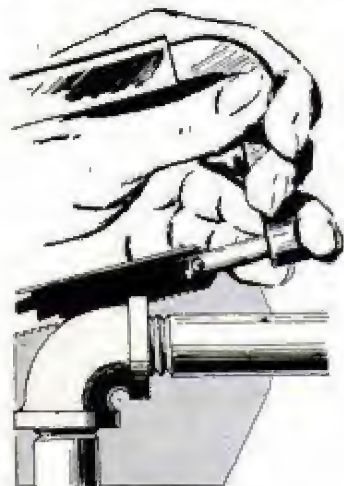


Dry Ice in Leaky Gas Tank Removes Vapors Before Welding

Searching for a safe, inexpensive way to weld a leaky gasoline tank, one man solved the problem by pouring about $\frac{1}{2}$ lb. of crushed Dry Ice into the tank after emptying it. The "ice" is allowed to stand in the tank for fifteen minutes before welding is started. During this time the ice turns to CO_2 gas, expelling all oxygen from the tank and condensing all gasoline vapors to the lowest point in the tank. This makes it possible to use an acetylene torch without danger of the tank exploding. The tank can be refilled and used immediately afterward without having to remove the Dry Ice, which soon evaporates.

W. B. Atran, Quincy, Mass.

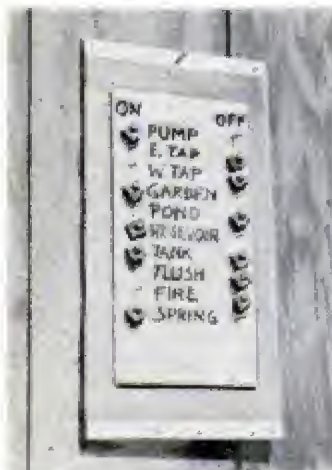
Removing Pipe From Fittings Without Damaging Threads



When salvaging pipe that has been seized into fittings, the thread on the pipe can be removed undamaged by sacrificing the fitting. Saw a slot in the fitting as shown, cutting just to the threads of the pipe. Then pour oil in the slot and rap the fitting a few times with a hammer. This will

loosen the threads sufficiently for removal of the fitting.

Indicator Shows Status of 10 Valves Serving Ranch Water System



To avoid wasting water in a drought-covered region, one ranch owner devised this simple indicator to show at a glance the condition of 10 valves required in a water system affecting 100 acres of land. When a water valve is turned on or off, as the case may be, a nut used as a marker for

each valve is placed in the appropriate column beside the proper heading.

Hi Sibley, Nuevo, Calif.

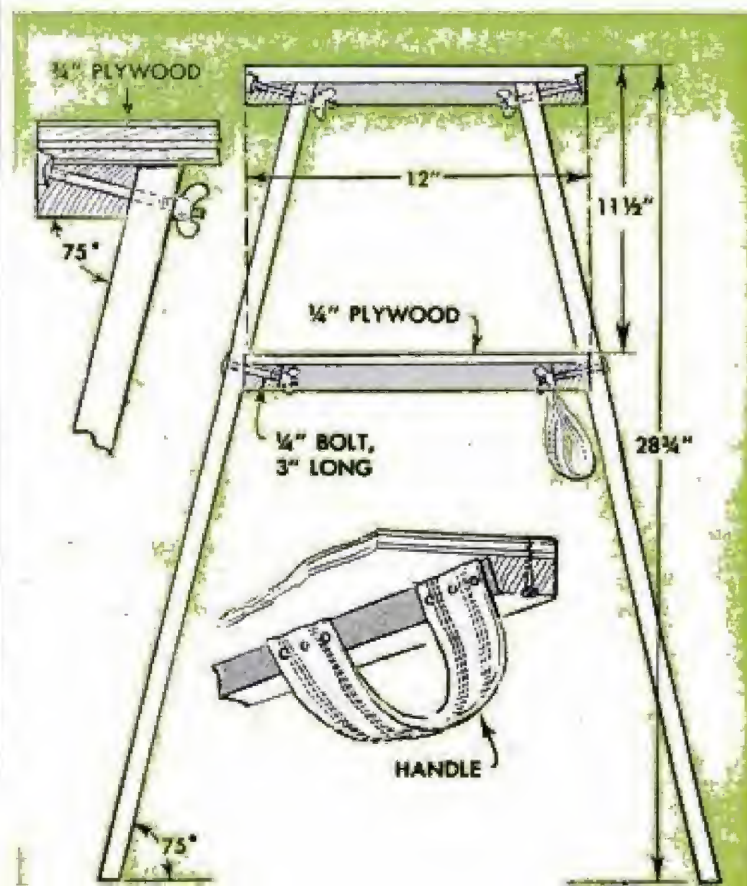
"SUITCASE"



By John Strickler

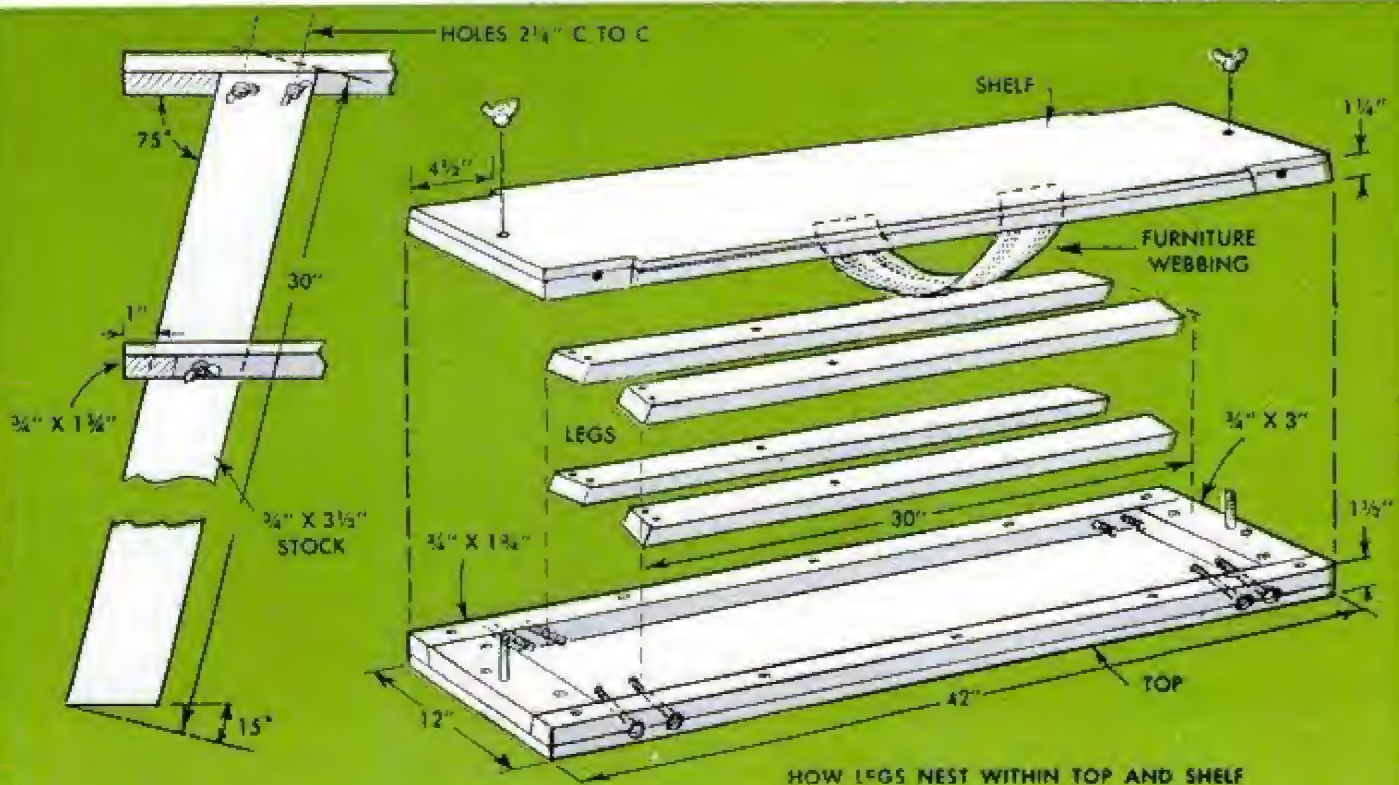
IF YOU HAVE wanted a sturdy, workbench-type sawhorse — one that can be set up quickly to make minor home repairs or for general tinkering — this one should fill your needs perfectly. Designed for packing the legs in a pocket formed by the top and shelf, the sawhorse is carried like a suitcase and takes no more space than an ironing board. This makes it easy to store in a closet, utility room or under a bed. It's made to order for the man who lives in an apartment, or a small home without a basement where space is at a premium.

The drawings give a clear idea of how the

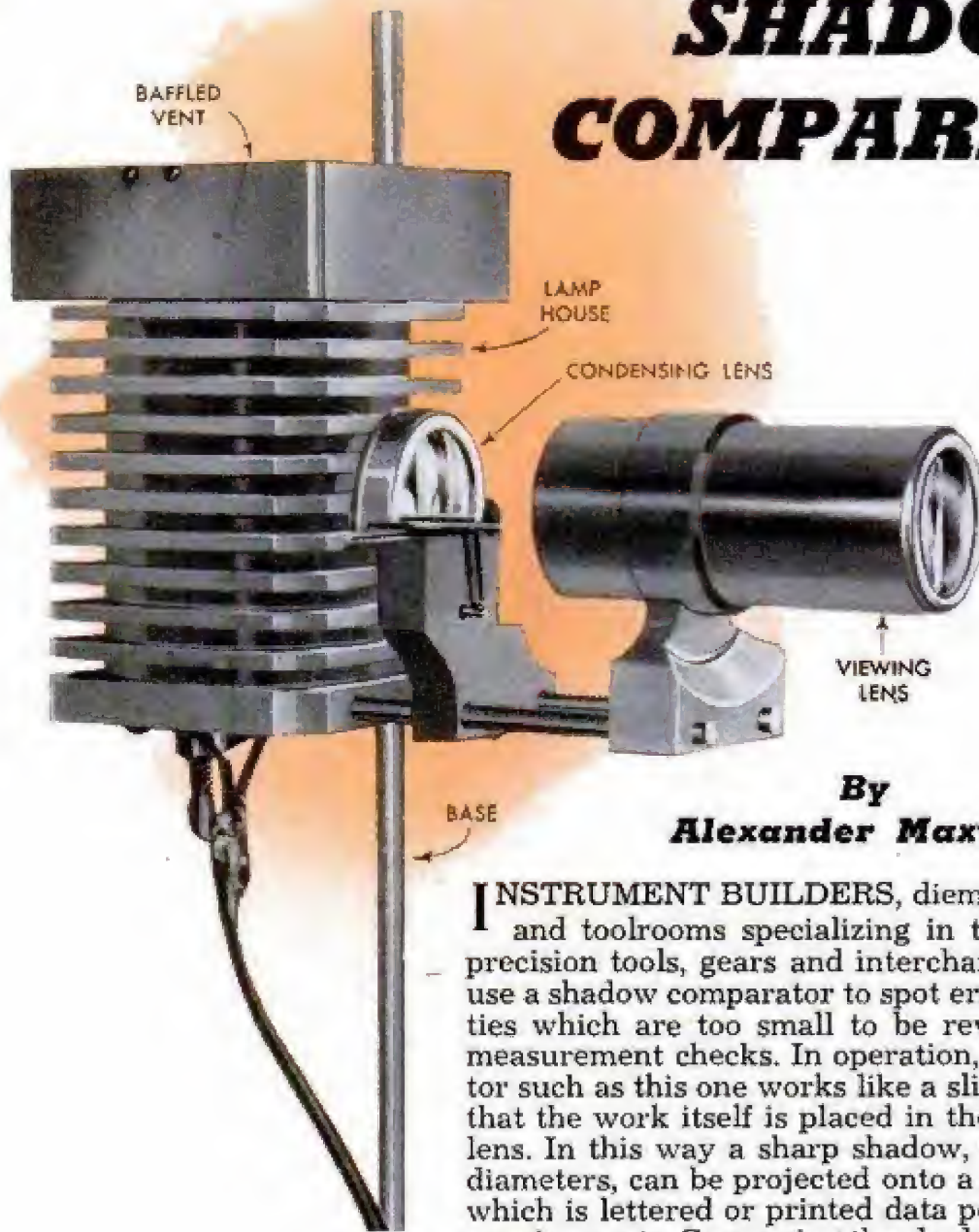


SAWHORSE

parts go together. If you want the horse to withstand hard usage, make the parts of hardwood such as birch. The recesses for storing the legs are formed by screwing a flat framework to the underside of both the top and the shelf. Note that in the case of the top frame, the inside edges of the side strips are beveled 15 deg., while 15-deg. notches are made at the outside corners of the shelf. The legs are made in pairs, right and left-hand. Compound cuts at both ends of each leg make the legs slant equally in two directions. Carriage bolts which lock the legs to the top are a wedge fit and are left permanently in place. Those holding the shelf are a loose fit, two of them being used to clamp the top and shelf together when packing the unit for storage. Note that the bolt holes in the edge of the top are counterbored to seat the bolt heads properly, while the side strips of the shelf frame are beveled 15 deg. to provide a flat surface for washers and wing nuts. A strip of upholstery webbing forms the handle. Finish the sawhorse with a coat of shellac and follow with varnish or lacquer.



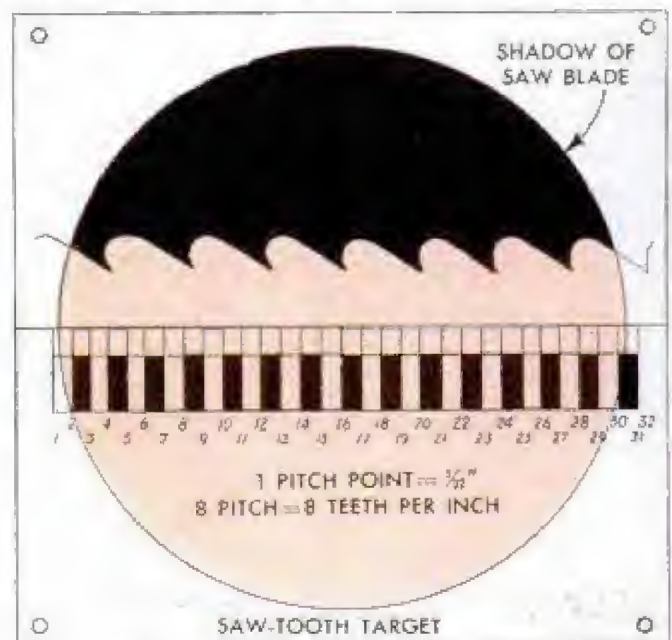
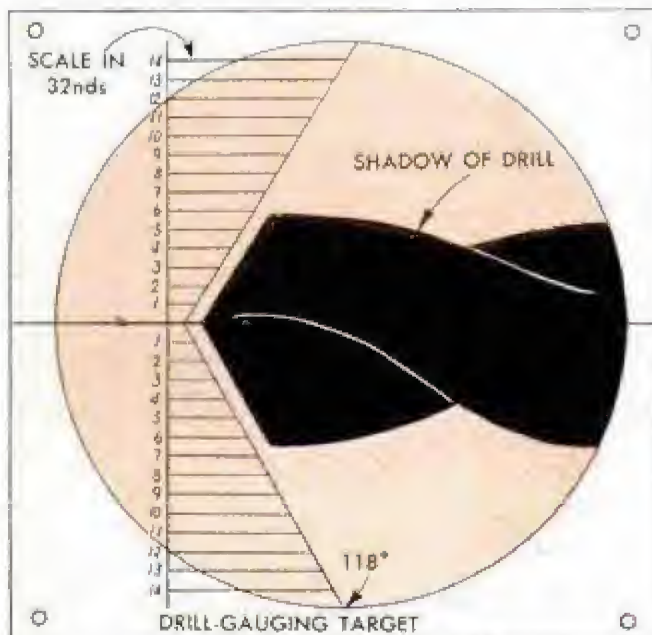
SHADOW COMPARATOR



By
Alexander Maxwell

INSTRUMENT BUILDERS, diemakers, school shops and toolrooms specializing in the development of precision tools, gears and interchangeable parts often use a shadow comparator to spot errors and irregularities which are too small to be revealed by ordinary measurement checks. In operation, a simple comparator such as this one works like a slide projector except that the work itself is placed in the focal plane of the lens. In this way a sharp shadow, magnified up to 20 diameters, can be projected onto a screen or target on which is lettered or printed data pertaining to the job requirements. Comparing the shadow of the work with the target or a precisely drawn profile will reveal wear progress and faulty grinding or machining in razor-

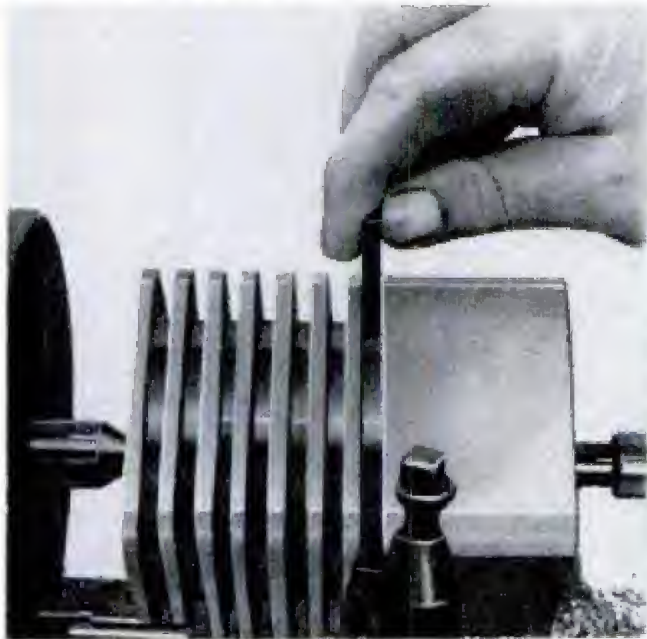
Shadow comparison reveals wear progress, faulty machining or grinding and other errors too small to measure



sharp clarity. Two typical targets are shown on the opposite page.

Location of the various parts of the unit is easily determined by study of the photo on the opposite page and construction details on the following page. The lamp house is made first, using a piece of machining aluminum or duralumin. Machine the fins to the dimensions and spacing given, then drill a clearance hole lengthwise through the piece for the metal-cutting bandsaw blade. The hole should be drilled in the waste inside the scribed circle indicating the size of the core. Allow for machining the cored hole after bandsawing as in the upper right-hand photo below. Next, the housing is bored for the condensing-lens barrel which may be purchased or made up as in the detail. In either case the condenser barrel must be a smooth press fit in the opening. The method of mounting the housing in a lathe chuck for boring the hole is

Cooling fins on lamp house are machined to precise dimensions and spacing. Corners of metal block are chamfered before machining to avoid metal fracture



After machining and coring, the lamp house is bored in the lathe to give a smooth inside surface. Bandsawing core saves nearly half the metal for further use



pictured in one of the photos. Note that the housing is secured to the chuck jaws with heavy wire to prevent it from shifting. Next, the housing is drilled and tapped for the guide rods, mounting bracket and the machine screws that hold the baffled vent and glare shield in place. The only dimension on the focusing mount for the viewing lens is the center-to-center distance between the holes for the guide rods on which it slides. It must be made up to suit the lens that is used. The details show only the general design of this part. This also is true of the condensing-lens mount.

The baffle consists of two sheet-metal plates secured to the top of the lamp house with spacers between. The glare shield is supported by brackets attached to opposite sides of the shield and to the top plate. Note that a hole, 2 in. in dia., is bored through the lower plate to provide ventilation. A socket for the 100-watt projection

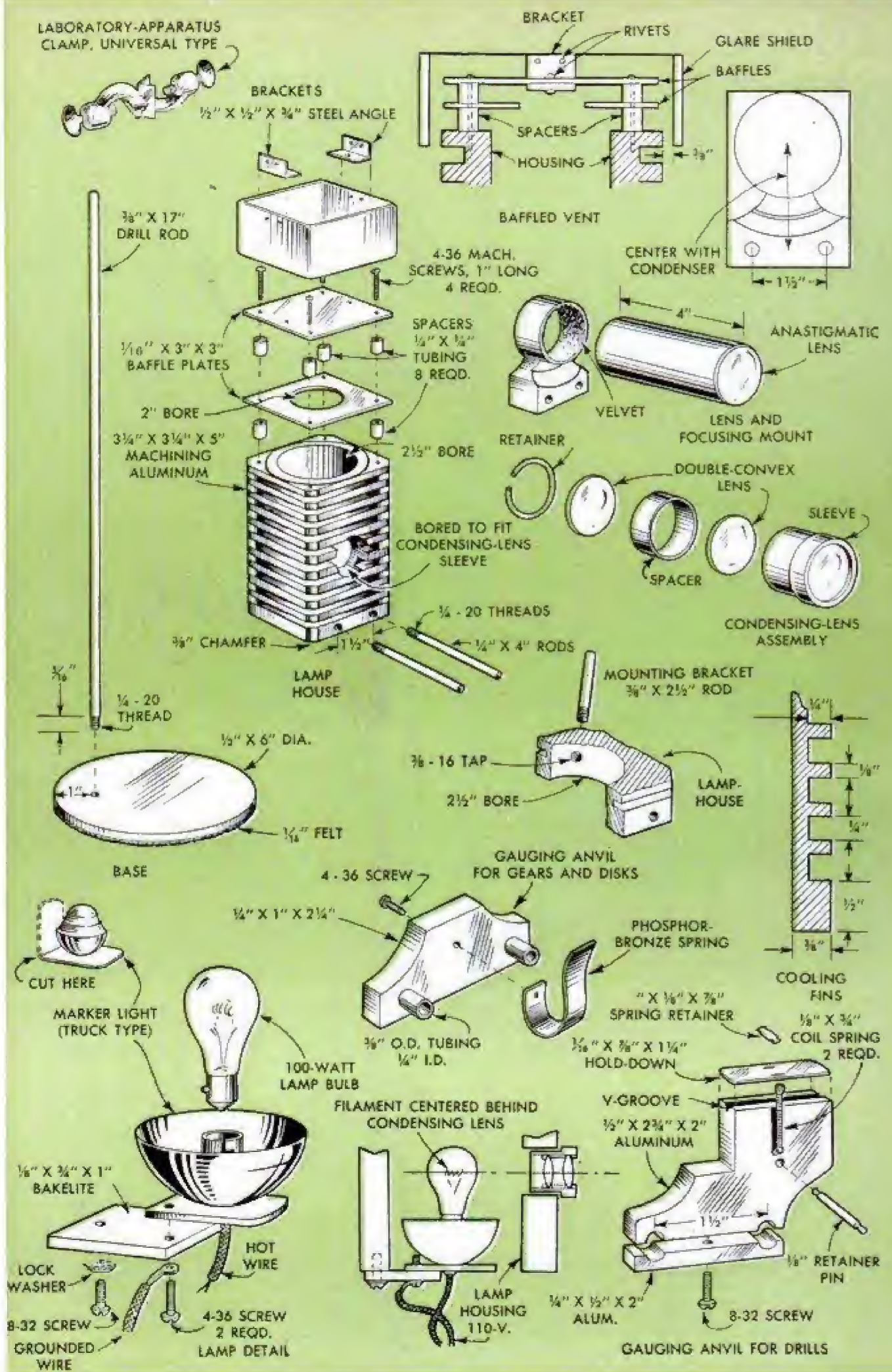
Lamp house is cored by bandsawing with a metal-cutting blade. A hole is drilled lengthwise through metal block for insertion of blade, which is cut and welded



Lens mounts can be turned in the lathe from brass or machining aluminum, or lenses may be purchased already mounted in a barrel. Cost is about the same



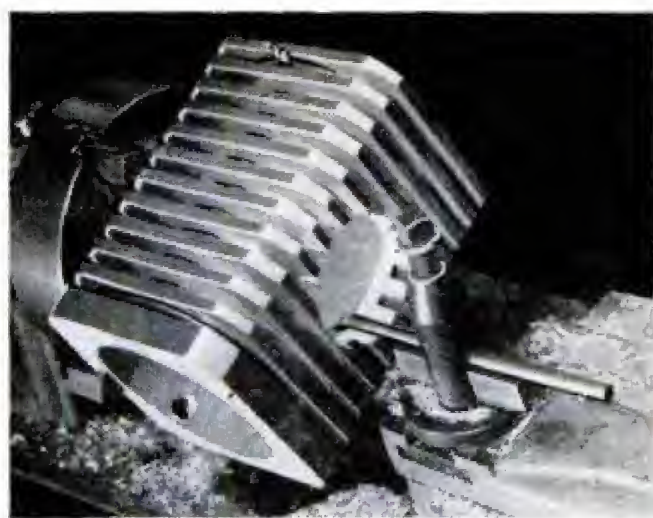
LABORATORY-APPARATUS
CLAMP, UNIVERSAL TYPE



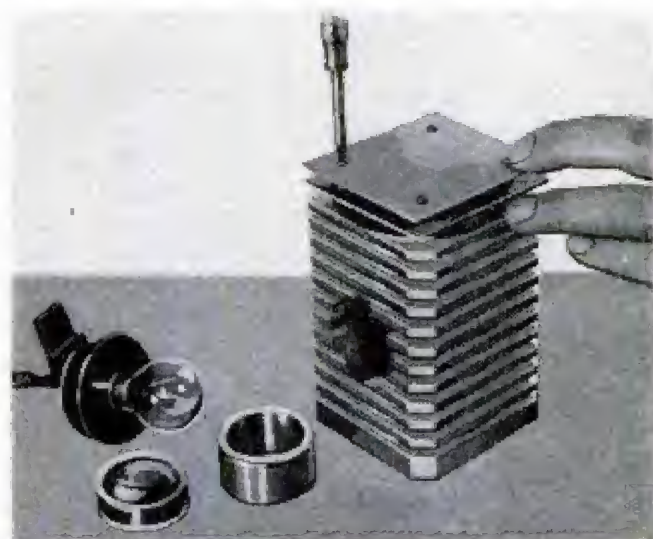
bulb is obtained by a simple adaptation of a truck-type marker light. Cut the marker-light bracket as indicated, attach it to a piece of $\frac{1}{8}$ -in. Bakelite and mount in the housing as shown in the details. The important thing in this assembly is to align the lamp filament with the center of the condensing lens. This may require the placement of spacing washers between the lamp bracket and the insulation, or between the insulation and the lamp housing, in order to lower or raise the lamp filament as required. Wire the socket as indicated and use a feed-through switch in the cord to control the lamp. The distance between the bulb and condenser must be determined by testing. Place the projector in the desired position, turn on the light and adjust the condenser so that the image of the filament does not appear on the screen or target. The light circle on the screen should be clear and bright.

A disk turned from $\frac{1}{2}$ -in. flat steel was used on the original unit to form the base. Cement $\frac{1}{16}$ or $\frac{1}{8}$ -in. felt to the bottom to protect polished surfaces and also to prevent the unit from sliding out of place. Drill rod was selected for the standard, or column, because it already is polished and is of a uniform size. The lower end of the $\frac{3}{8}$ -in. rod is shouldered to $\frac{1}{4}$ in. and threaded to screw into a tapped hole near the edge of the round base. Use a universal laboratory clamp for holding the projector on the column. The clamp provides an up-and-down adjustment on the column and also permits tilting the projector to any desired angle. If a laboratory clamp of the universal type is not available, then make a simple clamping fixture of the universal type by drilling and reaming $\frac{3}{8}$ -in. holes at right angles through a square block of mild steel. The holes should clear at the center of the block by $\frac{1}{16}$ in. Drill and tap into each hole for a thumbscrew. Many users will prefer this type of clamp as it provides a somewhat faster adjustment both on the mounting bracket for tilting the projector and also on the standard for raising and lowering the unit.

Only two holding fixtures or gauging anvils are detailed, as most users will make these to suit their own requirements. These slide on the guide rods between the condensing and viewing lenses, and provision usually is made for clamping them in a fixed position. A gauging anvil for twist drills is shown in position on the comparator pictured on page 204. Where a large number of parts are to be tested, it is best to improvise a suitable anvil or holder which will permit easy insertion and removal of parts of a uniform size. In certain types of work a holder having a movable section will prove to be useful.



Boring the lamp house for the condensing-lens barrel requires a tricky lathe setup. Mount in a four-jaw chuck and support the work securely by means of wire tightened around lamp house and chuck jaws as shown



Above, completed lamp house with the top baffle being screwed in place, also the condensing-lens mount and the lamp fixture completed and ready for fitting in position. Below, the completed projector ready for use, with a gauging anvil for twist drills. Other anvils or holding fixtures can be made as required



Telescoping Drive Shaft Saves Time When Tractor Powers Elevator



One farmer who uses his tractor to haul grain as well as power an elevator saves time with this drive shaft when changing the tractor from the wagon to the elevator. The drive shaft telescopes and has a universal joint at each end. These features make it unnecessary to have the power take-off unit of the tractor in perfect alignment with the power connection on the elevator, thus saving the time often required to jockey the tractor into exact position each time a load of grain is hauled from the field to the elevator. In this instance the drive shaft was assembled from the square portion of an old buggy axle which telescopes into a section of frame taken from an old hay loader. However, any square parts that telescope together may be used or a drive shaft of this type may be purchased.

A. M. Wettach, Mt. Pleasant, Iowa.

Floor Stand For Portable Grinder Made From Cream-Separator Base



Lacking the time to build a suitable floor base for his bench grinder, a farmer utilized a four-legged stand taken from a discarded cream separator. Almost all older-type separator stands are just the right height, having a flat top to serve as a mounting pad and splayed legs to give it unusual stability. In this case

the owner desired, to retain the portability of the grinder so he bolted the motor base to a hardwood board and used a C-clamp to

attach the grinder to the floor stand. For a permanent installation the motor should be bolted to the flat top of the stand.

Pitchfork Tines Kept Clean In Bag Of Dry Sand

To prevent any possibility of injury from the sharp tines and also to prevent damage from rust, one farmer thrusts his three-tined pitchfork into a bag of dry sand when not in use. The bag is filled about two thirds full of sand with the open end tied securely and is placed in any convenient spot in the hay barn.

Ervin L. Strayhorn, Beebe, Ark.



Sleeves on Planter Hoppers Increase Seed Capacity



Many farmers find they can save time when planting by increasing the capacity of the hoppers on their planters so that seed can be carried the entire length of each row in a single loading. Sheet-metal sleeves, designed to serve this purpose, can be made at very little cost and attached quickly when needed by slipping them inside the hoppers. Fitted snugly, sleeves will not require fastening.

Water Cleans Gummy Shears

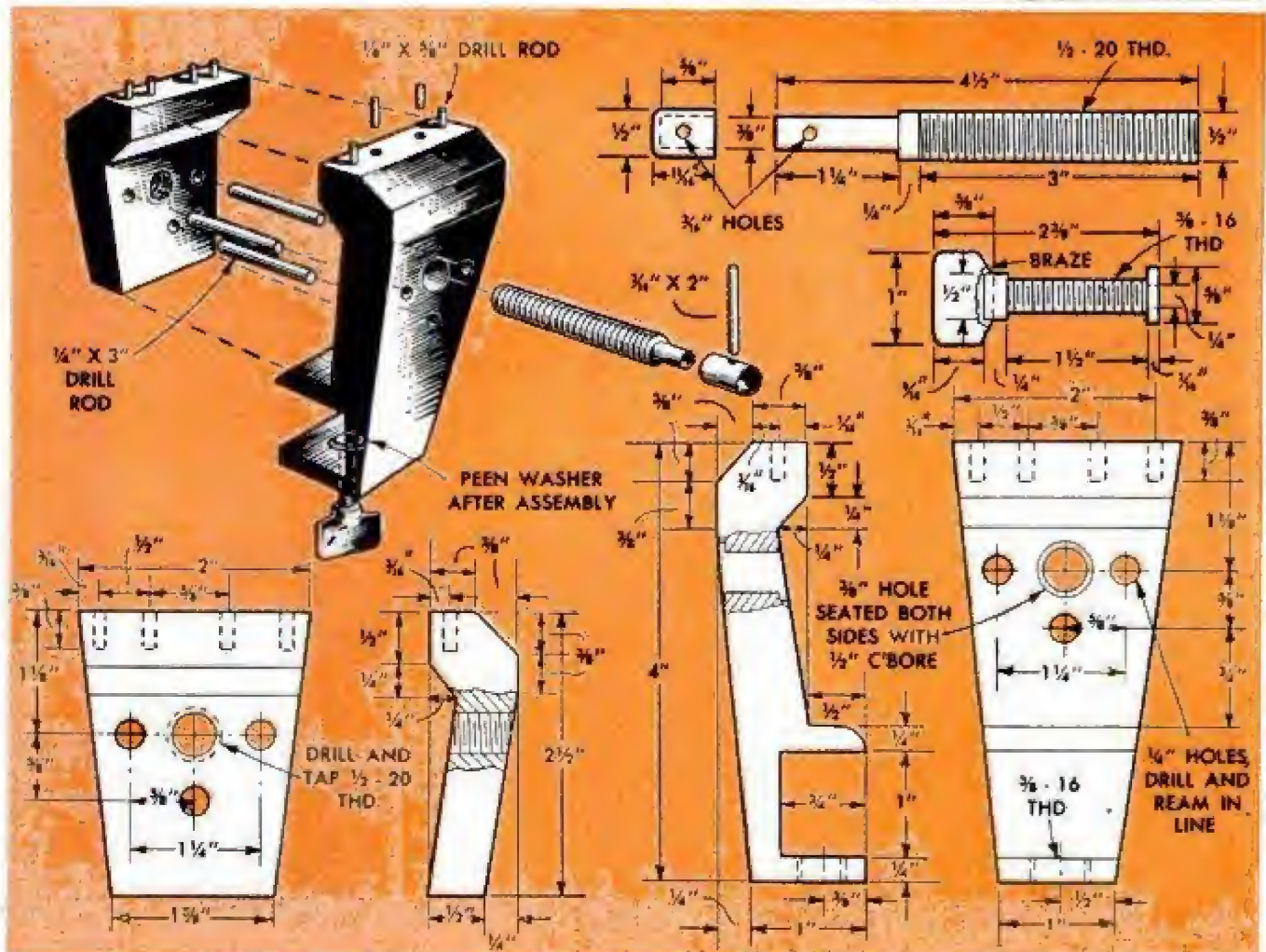
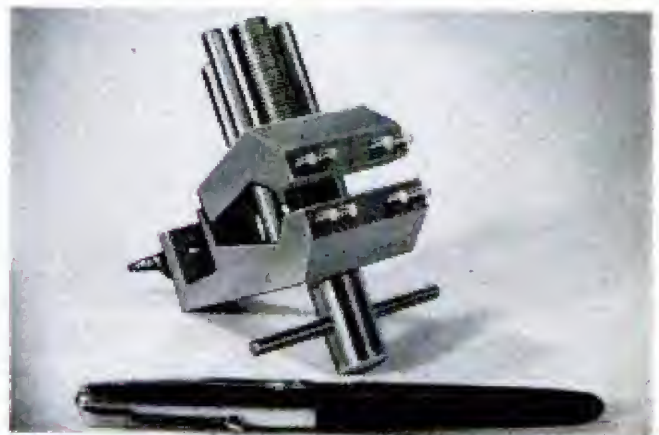
If shears are used to cut roofing, blades of the shears can be kept clean by dipping them in water frequently. Or, better still, keep them in a can of water between cutting operations.

Precision Modelmaker's BENCH VISE

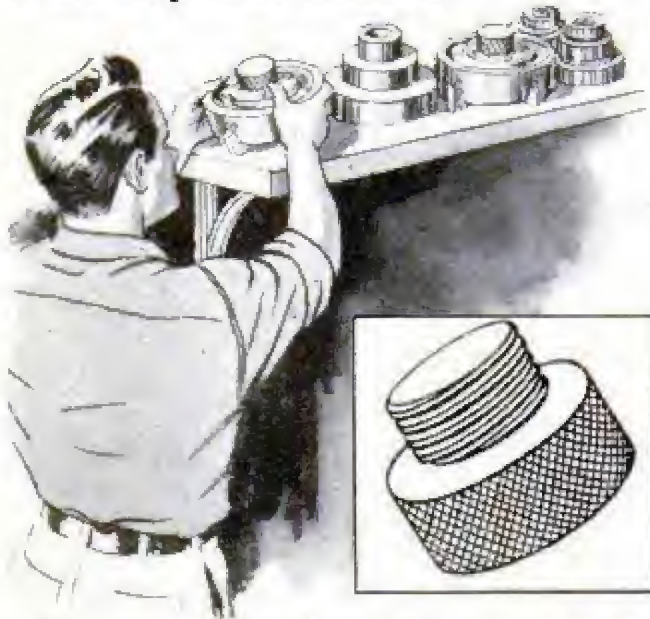
By Roy V. Hamlin

DESIGNED PRIMARILY for use at a watchmaker's bench, this tiny precision-built vise will be found equally useful by the exacting modelmaker. An excellent metalworking project in itself, the making of the vise embodies varied lathe and milling operations.

The three guide pins which are pressed in the body of the vise maintain a close sliding fit in the movable jaw to hold the jaw faces in perfect alignment. A series of removable stud pins in the tops of the jaws provides a means of clamping disks and other odd-shaped work securely. For a really fine tool, the completed parts of the vise should be carbonized, hardened and ground. You can have the hardening done at any local heat-treating shop. Specify a Rockwell hardness of 60-62 C scale. Holes for the guide pins should be made .002 undersize to allow for lapping after the vise has been hardened. This will assure a perfect fit. The drawings below detail the various parts and also show the assembly.



Plugs for Stored Lathe Chucks Protect Spindle Threads



If you are in the habit of storing chucks under the lathe, the threads can be protected against possible damage from falling tools and also kept free of chips and oil by using plugs such as the one detailed. These are turned from fiber or wood and should be threaded to screw loosely into the spindle openings of the chucks. If the latter are stored on a shelf or bench, the projecting plugs will necessitate placing the chucks flat side down, thus helping to protect the jaws from settling dust.

C. W. Woodson, Miami, Fla.

Portable Acetylene Welding Rig Carries Motor-Powered Grinder



Steel pipe and heavy flat steel were used to construct this unique welding rig, which carries its own grinding wheel. Two lengths of angle steel form a bed on which the acetylene tank is held in a readily accessible position. Mounted on three wheels, the unit is easily manipulated as the front-wheel yoke is pinned to the frame to permit turning. The upright member supports a steel platform which, in turn, supports a $1\frac{1}{2}$ horsepower air-cooled gasoline engine.

This furnishes the power for driving either a stationary grinding wheel or one that rotates on a flexible shaft.

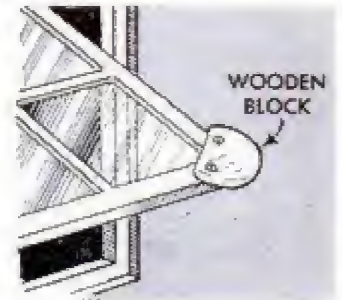
L. H. Houck, Jefferson City, Mo.

Guards on Corners of Windows Prevent Head Injuries

When casement windows are used in shops and farm buildings, there is always the possibility that a workman may accidentally bump his head against a sharp corner of an open window and cause a severe injury.

To prevent this, circular wooden blocks are screwed to the corners of the windows to shield the sharp edges. Painting the blocks to match the color of the windows makes them inconspicuous.

Lee H. Schrimpf, Tulsa, Okla.



Locating Underground Pipe Leak

One man found that by pumping a thin mixture of white lime and water into an underground run of pipe he was able to tell the exact locations of any leaks. Even in extremely wet weather the lime rises to the surface of the ground, discoloring the soil in the area above the pipe that must be unearthed for repair or replacement.

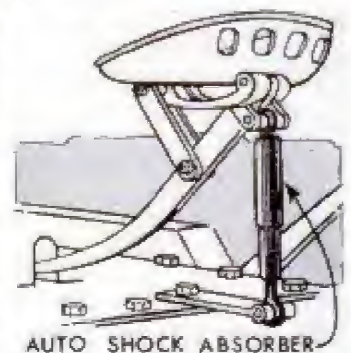
H. Miller, Danboro, Pa.

Old Auto Shock Absorber Cushions Tractor Seat

To lessen the bounce of a tractor seat while driving over rough ground, one farmer installed an airplane-type auto shock absorber under the seat to cushion hard shocks and snub out the rebound of the seat.

On most tractors the installation of the shock absorber is quite simple, requiring only a U-shaped bracket attached either to the seat itself or the seat column. The lower end of the absorber pivots on a bolt passing through the eye of a flat bracket attached to the transmission housing. The design and size of the bracket must be adapted to the tractor on which the installation is to be made.

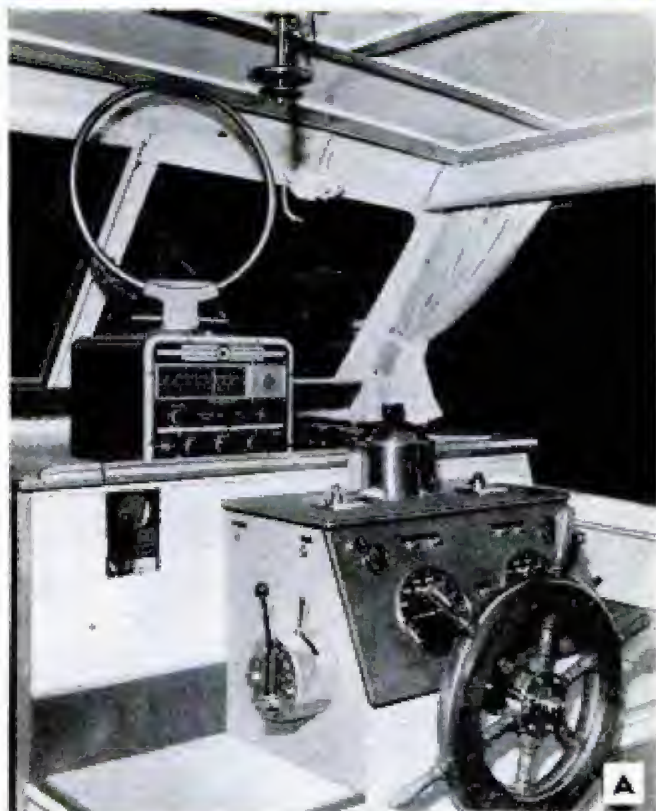
Kenneth Gabrosek, Fly Creek, N. Y.



Radio and Radar Equipment For Small Craft

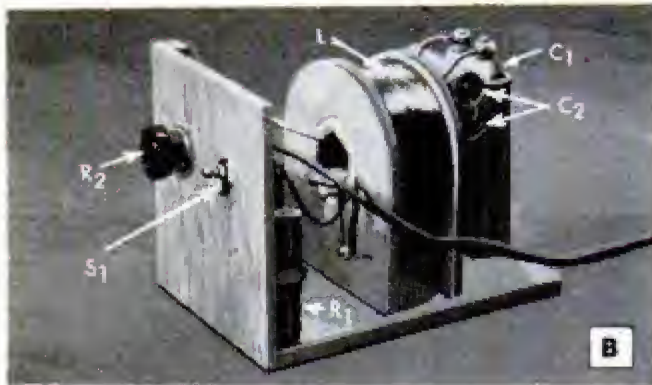
BOATING enthusiasts visiting the 1952 National Motor Boat Show in New York City had an opportunity to see the latest marine radio and electronic equipment designed by the Radiomarine Corporation of America for small craft. The radio direction finder shown in photo A is a popularly priced unit that weighs only 14 pounds. It is combined with a three-band receiver that permits reception on the low-frequency and radio-beacon band of 130-400 kilocycles, the marine-radio band of 1740-5600 kilocycles and also the standard broadcast band.

A five-watt radiotelephone is illustrated in photo B. This compact unit combines a four-channel crystal-controlled ship-to-shore radiotelephone and a superheterodyne entertainment receiver for the standard broadcast band. It is equipped with a built-in speaker and a hand microphone. A 30-watt two-way radiotelephone for medium-sized yachts appears in photo C; it combines a six-channel crystal-controlled receiver and an eight-tube receiver. The small-craft radar unit, photo D, operates on a wavelength of 3.2 cm. and has power and sensitivity to pick up objects as close as 75 yards and as distant as 20 miles.



TWO-WAY LOUDSPEAKER

★ ★ ★ *With Lifelike Sound*



By Dr. Richard C. Hitchcock

YOU WILL BE thrilled with the lifelike reproduction of this unit. Following a trend of advanced design for high-fidelity enthusiasts, this two-way folded-horn enclosure will reproduce your records with solid bass and clear treble tones that you probably didn't know were there. If you have a good audio amplifier, this is the loudspeaker to go with it. Extended-range loudspeakers in the proper enclosures do an excellent job, as far as they go, but horns or baffles large enough to go much below 100 cycles per second are usually too large for a living room. It generally is accepted that separate speakers are required to get good reproduction of both bass and treble tones. The low-frequency speaker (woofer) takes the lowest notes and goes on up to a few hundred cycles. The high-frequency speaker (tweeter) takes over at this point and goes on up to 15,000 cycles per second, and a network should be provided to divide the energy between the two types of speakers.

It is important that the amplifier used

MATERIAL LIST

Item Req'd.	Dimensions, in.	Name	
1	2	$\frac{3}{8}$ X 22 $\frac{3}{4}$ X 41	Sides
2	1	$\frac{3}{8}$ X 5 $\frac{1}{4}$ X 14 $\frac{1}{2}$	Cap No. 1
3	1	$\frac{3}{8}$ X 5 $\frac{1}{4}$ X 14 $\frac{1}{2}$	Cap No. 2
4	1	$\frac{3}{8}$ X 14 $\frac{1}{2}$ X 28 $\frac{3}{8}$	Back No. 1, hole for low-freq. spkr.
5	2	$\frac{3}{8}$ X 3 $\frac{1}{4}$ X 14 $\frac{1}{2}$	45-deg. corners
6	1	$\frac{3}{8}$ X 4 $\frac{1}{2}$ X 28 $\frac{3}{8}$	Brace No. 1
7	1	$\frac{3}{8}$ X 4 $\frac{1}{2}$ X 12 $\frac{1}{4}$	Brace No. 2
8	1	$\frac{3}{8}$ X 4 $\frac{1}{2}$ X 13	Brace No. 3
9	2	$\frac{3}{8}$ X 14 $\frac{1}{2}$ X 13	Top of bottom, front of back
10	1	$\frac{3}{8}$ X 14 $\frac{1}{2}$ X 22	Bottom
11	1	$\frac{3}{8}$ X 14 $\frac{1}{2}$ X 25 $\frac{3}{4}$	Lower front
12	1	$\frac{3}{8}$ X 14 $\frac{1}{2}$ X 3 $\frac{3}{4}$	Upper front
13	1	$\frac{3}{8}$ X 14 $\frac{1}{2}$ X 18 $\frac{1}{4}$	Back No. 2
14	1	$\frac{3}{8}$ X 4 $\frac{1}{2}$ X 14 $\frac{1}{4}$	High-freq.-spkr. base
15	2	$\frac{1}{2}$ X 6 $\frac{1}{2}$ X 6 $\frac{3}{8}$	High-freq.-spkr. mtg. left and right
16	1	$\frac{1}{2}$ X 6 $\frac{1}{2}$ X 5 $\frac{3}{8}$	High-freq.-spkr.-mtg. ctr.
17	1	$\frac{3}{8}$ X 15 $\frac{1}{2}$ X 22 $\frac{3}{4}$	Top
18	1		Low-freq. spkr. (woofer) Jansen P 12 P
19	3		High-freq. spkrs. (tweeters) Jansen P-5-TX*

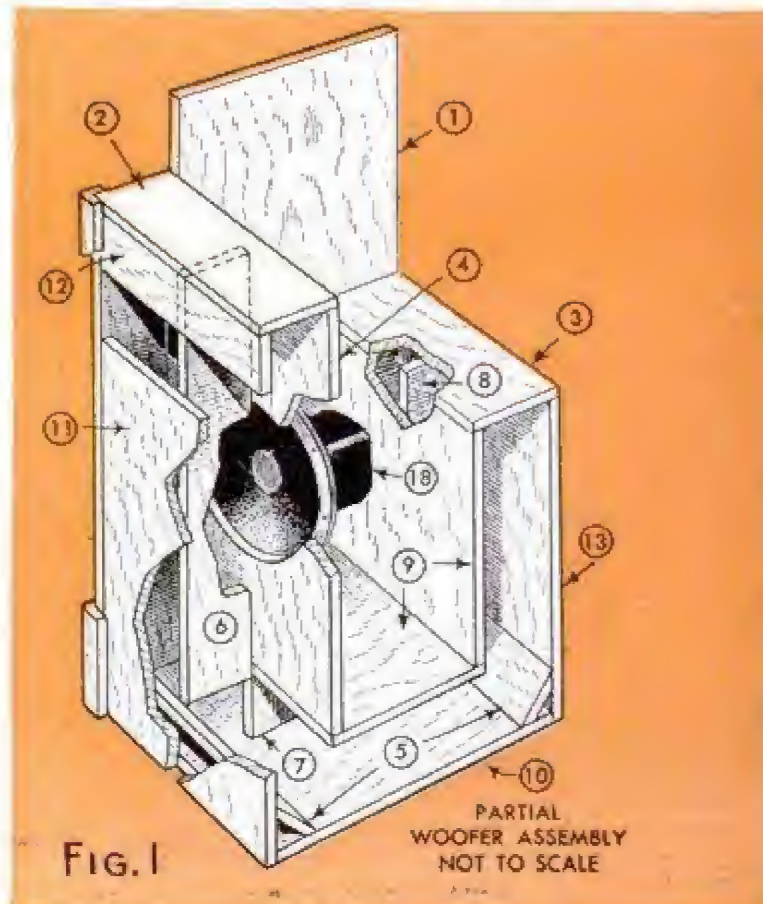


FIG. 1

PARTIAL
WOOFER ASSEMBLY
NOT TO SCALE

SYSTEM *Reproduction*

with this system have a minimum of hum. Most table-type radios do not have sufficient filtering and many radio receivers have inadequate output transformers for both very high and very low tones. Several construction articles for suitable audio amplifiers of the high-fidelity low-hum type have appeared recently in this magazine.

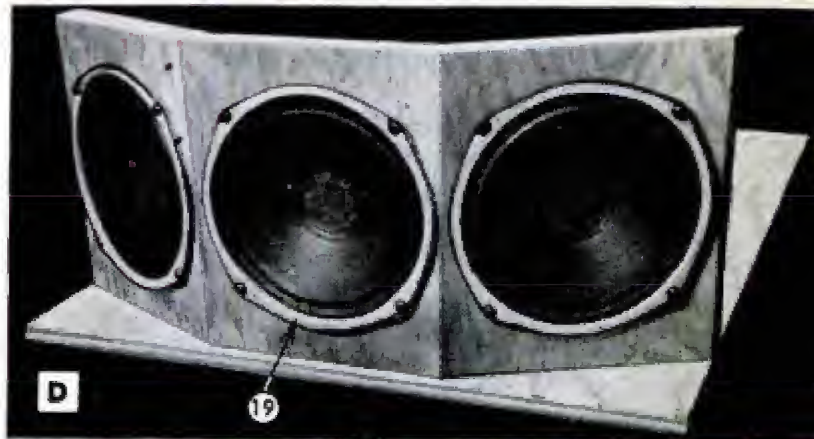
The loudspeaker system, shown in photos A and C, takes less floor space than a radio console. The space required is only 15¼ in. wide and 22¾ in. deep. The height is 41 inches. The three tweeters are a special feature. Mounted as shown in photo D, and Figs. 3 and 4, they spread the high tones over a wide angle at ear level. This spread removes the annoyance of high-tone beams from a single source. For example, spread over a wide angle, the high tones of the applause and laughter of an audience are re-created realistically.

The tweeters are five-in. extended-range permanent-magnet (PM) speakers. Ordinary speakers do very well up to 10,000 cycles, but the extended range continues up to 15,000 cycles, so the added cost of the

(Continued to page 246)



C



D

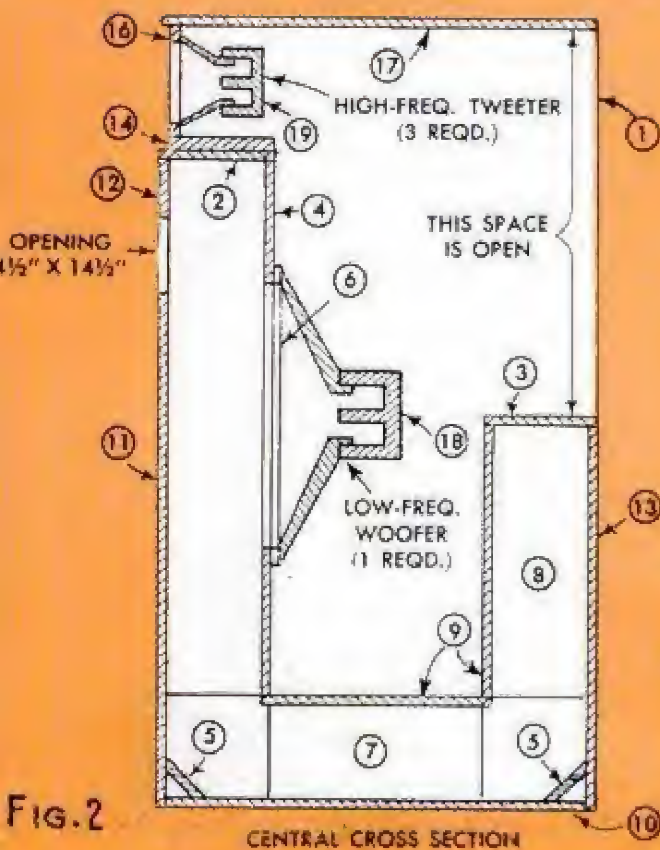
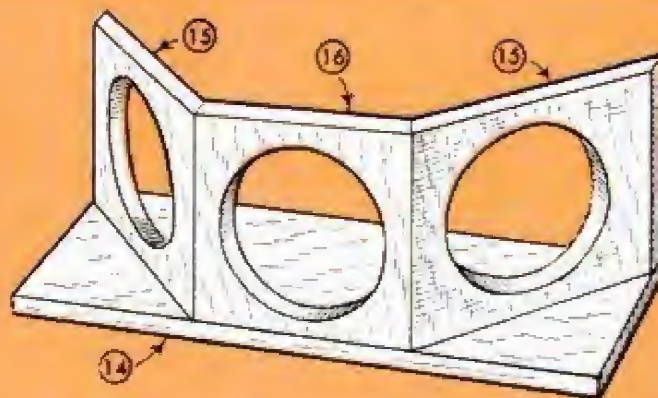
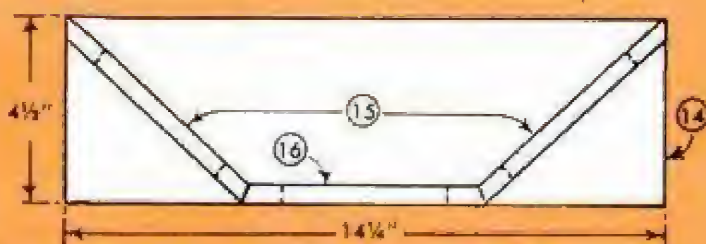


FIG. 2



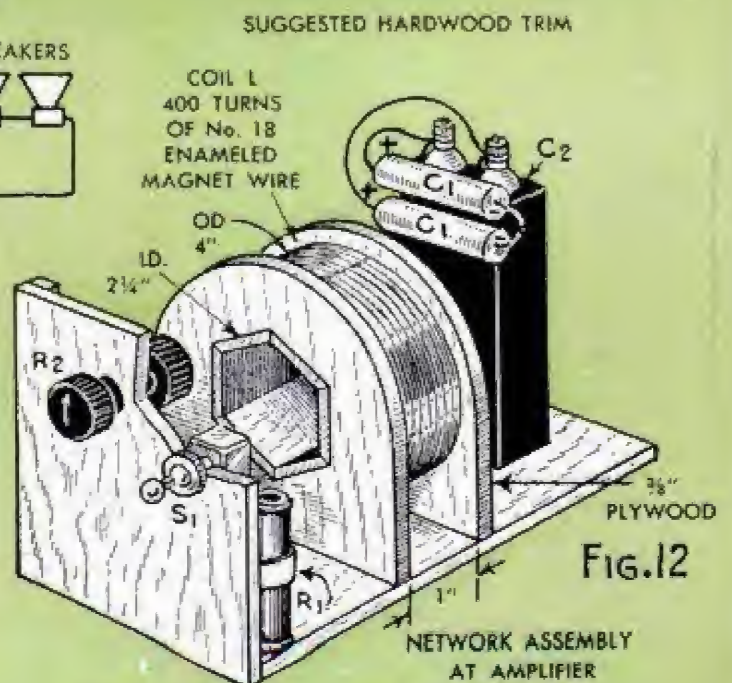
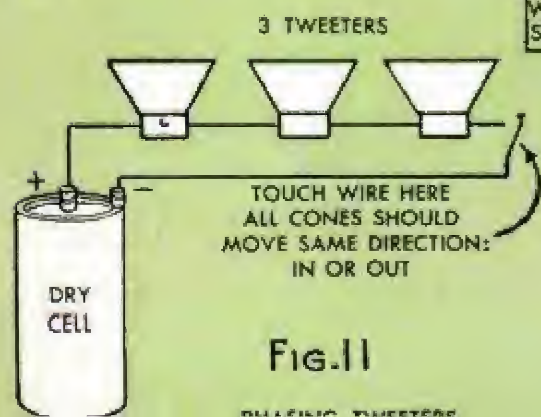
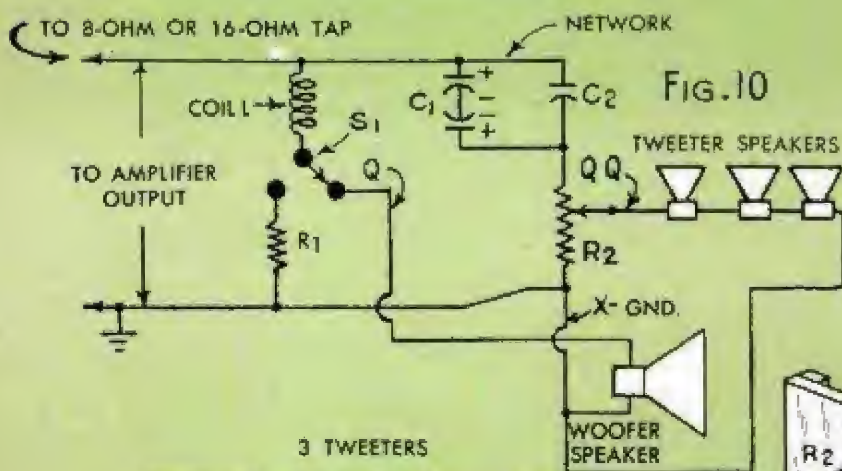
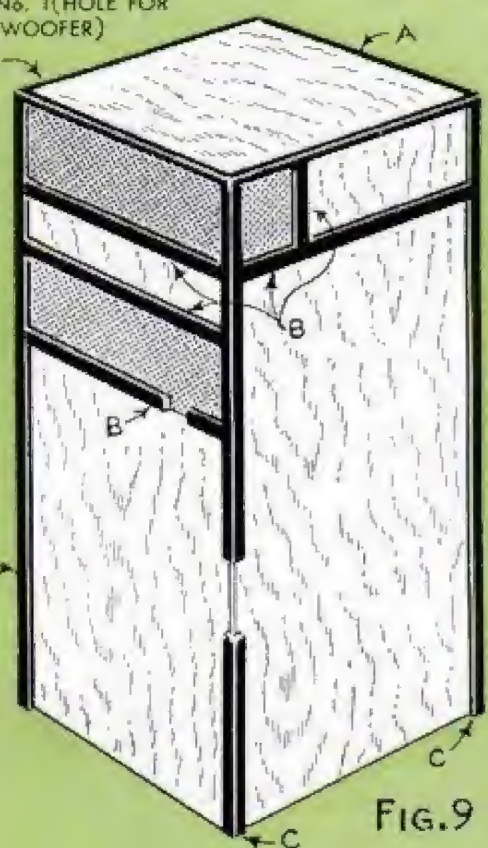
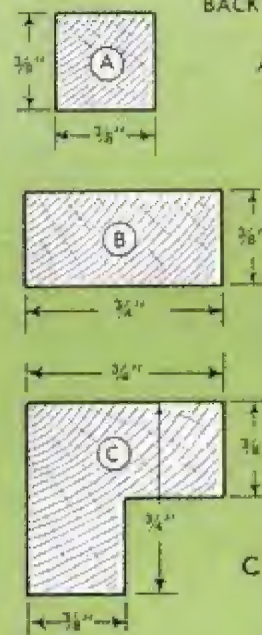
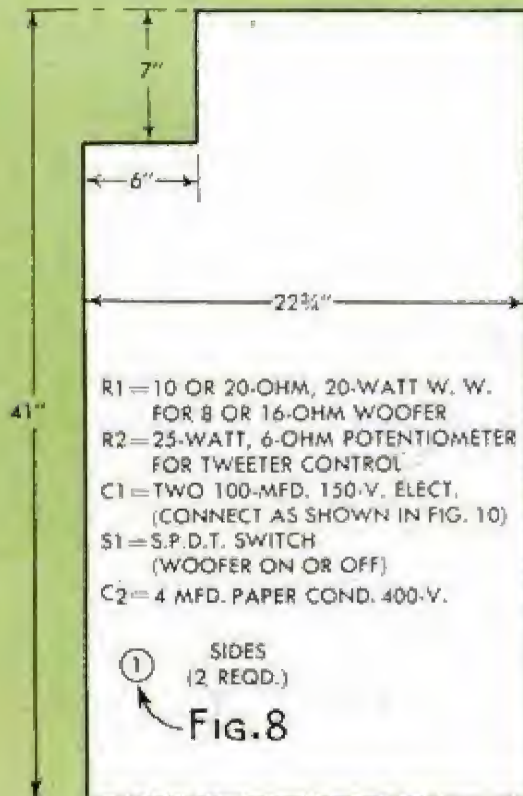
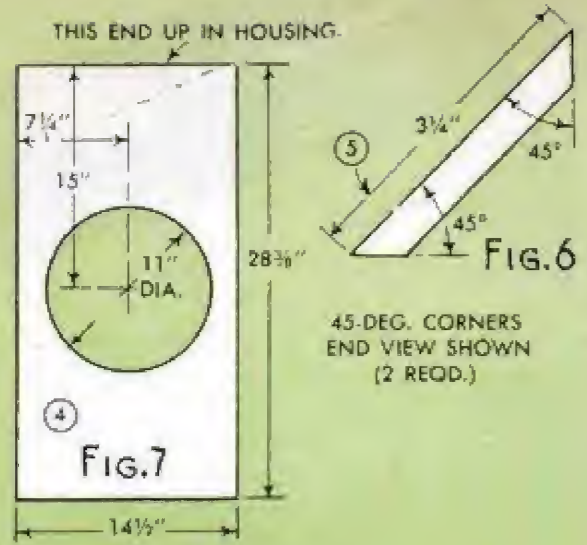
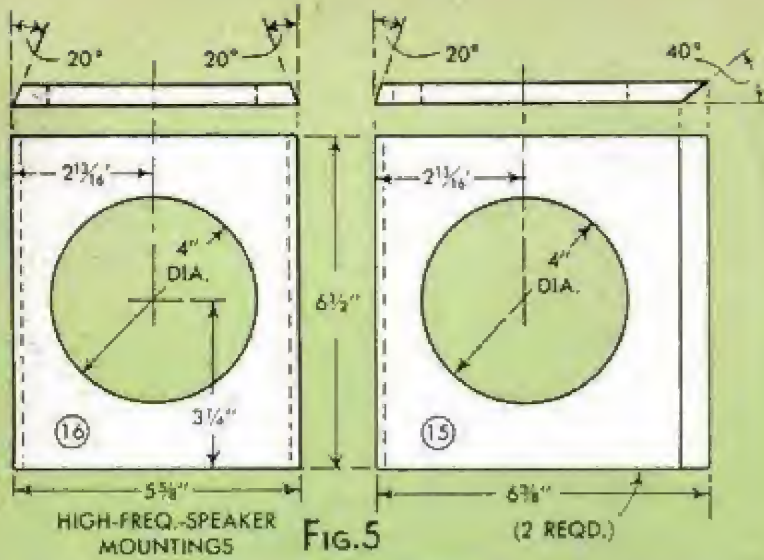
HIGH-FREQ.-SPEAKER MOUNTING

FIG. 3



HIGH-FREQ.-SPEAKER MOUNTING (TOP VIEW)

FIG. 4

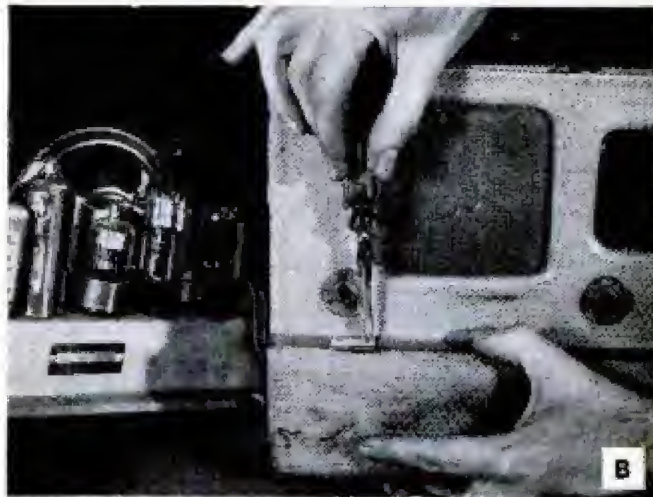


NOTE—Q, QQ AND X-GND. LEADS IN FIG. 10
GO TO SPEAKERS IN CABINET

Portable Cabinet Repairs

MANY old portable radio receivers are still in good working order electrically, but have been banged around until the covering on the cabinet is in poor condition and definitely unattractive. In rejuvenating the one shown in the photos, the old covering of woven cloth was left in place as it was not torn. Over most of this was placed a plastic-film veneer simulating leather, the panel and inside cover surfaces being finished with colored lacquer.

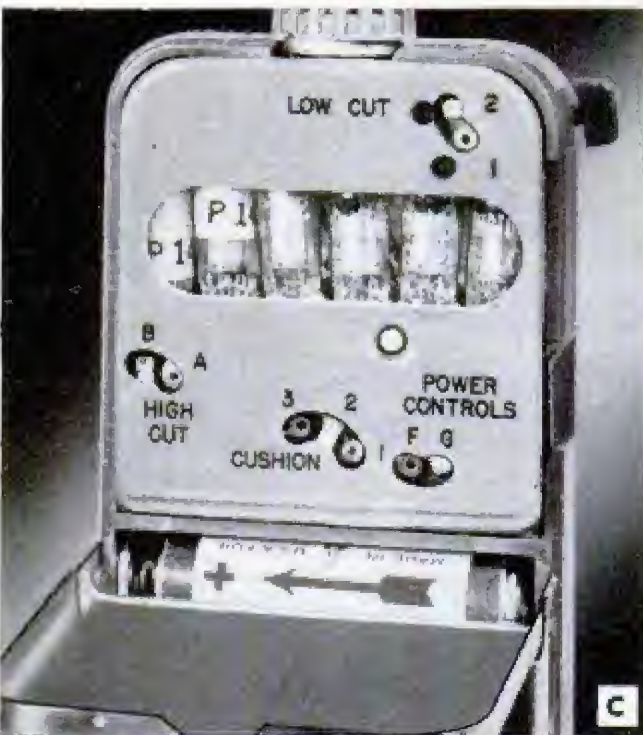
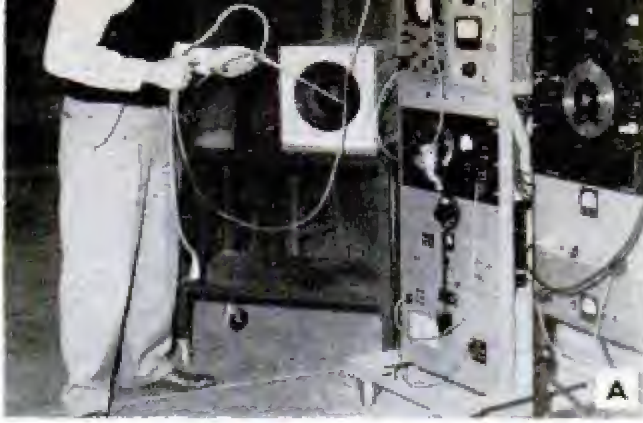
First, remove the control knobs and receiver chassis and set them aside. Then remove the handle, dial plates, speaker-grille screening, dial window and hinges and latches, as illustrated in photos B and C. Clean the old covering by washing it with a solvent such as a lacquer thinner, then apply the adhesive that is to hold the new finishing material in place. The plastic film used was smoothed into place with a rubber squeegee as shown in photo D. Use a razor blade for trimming and prick bubbles with a pin if necessary. New rubber-headed feet were installed, and the panel and inside cover were given a coat of light-green lacquer brushed over the original covering, see photos E and F. Small metal parts, such as dial plates, hinges and latches were given a coat of clear lacquer. The completed job appears in photo A. Lacquer and solvent should be used away from flame and in a well-ventilated room.



UNUSUAL MICROPHONES AND HEARING AIDS

PHYSICISTS and radio engineers have long sought the perfect microphone—a microphone which can hear every tone equally well from any place in its vicinity. Dr. R. W. Leonard, associate professor of physics at the University of California, Los Angeles, has taken a definite step toward this microphone in a laboratory-useful model of a “resistively terminated probe microphone.” The new instrument, shown in photo A, resembles a mechanic’s oilcan, the sound being picked up by what corresponds to the tip of the spout with the microphone near the handle. It utilizes a condenser microphone having an air tube terminated with sound-absorbing material.

The pocket-size high-gain hearing aid, illustrated in photos C and D, employs six subminiature-type tubes. It has been designed by Sonotone engineers for persons who, because of severe hearing impairments, previously had to use large hearing aids with external batteries or units powered by the electric-light lines. Specially designed low-drain tubes and a mercury A-battery are claimed to operate this hearing aid for more than 50 hours. The tiny but powerful permanent magnet from one of the hearing aid’s receivers can support an iron bar 300 times its own weight as demonstrated in photo B. The bar weighs 17½ ounces. A special magnetic pickup, held against the shell of any telephone receiver, permits telephone conversations to be amplified through the hearing aid as illustrated in photo E.





PERFECTION IS HIS STANDARD...

Like you, he recognizes no compromise with perfection... accepts only one quality of materials, workmanship, tools. You gauge the work of others by your own rigid standard and are proud to have others measure up to it.

Bonney wrenches are made to the same standard of perfection. That is why mechanics call them America's finest—unmatched for lightness, strength, balance, and precision.

Bonney wrenches are the pride of the men who make them... the pride of the men who use them.

BONNEY FORGE & TOOL WORKS



Perfection is the standard of the men who design and build America's Diesel engines... power plants carrying names like Baldwin, Cummins, American Locomotive, Fairbanks Morse, Hercules, Ingersoll-Rand, Worthington, General Electric, that set new standards of performance in

TOUGH

but oh so

GENTLE

TOUGH on oil-pumping
GENTLE on cylinder walls

Using too much oil? You need the piston rings that are *tough* on oil-pumping.

Want to stretch your engine's life? Then get the rings that are *gentle* on cylinder walls.

There's just one thing to do about worn-out piston rings and that's replace them—and the more you delay the more you'll pay.

You'll save money if you replace them with Hastings Piston Rings. They're engineered exclusively for replacement service. They *stop* oil-pumping, *check* cylinder wear, *restore* engine performance—for thousands of extra miles. It's the best money you can spend on your car.

HASTINGS MANUFACTURING CO., Hastings, Mich.

HASTINGS LTD., Toronto

Piston Rings, Spark Plugs, Oil Filters, Casite, Drout



HASTINGS

STEEL-VENT
PISTON RINGS



**GO OUTSIDE AND
LOOK AT YOUR HOUSE
..RIGHT NOW...**

**Isn't THIS
what it needs?**

Why gamble with ordinary paint when the best costs so little? Enough SWP House Paint for the average six-room home costs less than \$45.

Now is the time to protect your house against everything the weather can think of—with the kind of paint that has what it takes to grow old beautifully. SWP has been the standard of quality in house paint for 70 years.

SWP House Paint is *Weatherated* . . . built to meet and lick every condition of weather and wear that paint is up against. Paint now with SWP and have the best looking home in your neighborhood.

Ask your Sherwin-Williams dealer to show you how SWP House Paint is *Weatherated* to clean itself and wear longer.



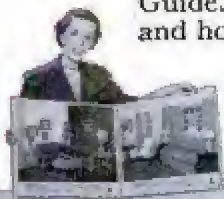
IT'S WEATHERATED

That means SWP is tested rigorously for its ability to resist chalking, checking, cracking, fading and dirt collection.

**Now is the time to
paint your house!**

FREE . . . For Decorating Ideas let your Sherwin-Williams dealer show you or lend you the big Paint and Color Style Guide. Scores of large color photographs of beautiful rooms and homes. Hundreds of authentic color styling suggestions.

If you wish, we will recommend a reliable painting contractor.



**IT PAYS TO SEE THE
DEALER WHO SELLS**

SHERWIN-WILLIAMS PAINTS

©1952, The Sherwin-Williams Co.

SHERWIN-WILLIAMS AND ITS ALLIED COMPANIES LEAD THE WORLD IN PAINT RESEARCH

Helpful facts about filters...



Normal photograph



Taken with Yellow (K2) Filter



Normal photograph



Taken with Yellow (G) Filter



Normal photograph



Taken with Green (X1) Filter



Normal photograph



Taken with Red (A) Filter

Why they do so much for your snapshots

Taking snapshots without a filter can be like eating flapjacks without butter—their full flavor and appeal are often not brought out.

Examples of what some of the most popular Kodak Wratten Filters will do are shown on the left. For instance, the K2 Filter is perfect for making clouds look like clouds—white and fleecy. And for more dramatic sky emphasis, you have the more powerful dark yellow G Filter. Yellow filters, including the new Kodak Cloud Filter for use with inexpensive cameras, may be used with orthochromatic or panchromatic films.

For emphasizing background foliage and clouds—and at the same time giving a pleasing natural modeling to faces photographed against a blue sky—you can use the green Kodak Wratten Filter X1 (with panchromatic film only). And for the most spectacular, thrilling sky rendition of all, try the red A Filter (panchromatic and infrared films only).

As you use and enjoy filters, you will want to add to your collection. So be sure to see your Kodak dealer for a complete list of Kodak Wratten Filters. Prices start at \$1.65 (Kodak Cloud Filter, any size, \$1.72).



Warm up your distant color shots with a Kodak Skylight Filter—With this filter you reduce the bluish cast that often appears in distant scenes. Use it to get warmer-tone pictures of mountains, seascapes, sunlit snow scenes . . . pictures made in open shade under a clear blue sky and on overcast days. Requires no change in normal exposure. Prices start at \$1.65.



Reproduction from normal color transparency



Reproduction from color transparency using Kodak Pola-Screen

Darken the sky in your color pictures

—A Kodak Pola-Screen does the trick—in color or black-and-white. Also offers the only sure way to subdue reflections from glass, wood, water, and other nonmetallic surfaces. The effect your Pola-Screen will have on the picture may be predetermined by looking through the Kodak Pola-Screen Viewer—a miniature screen which fits over the indicator handle of your Pola-Screen. Varying degrees of sky-darkening can be obtained by rotating the screen. Price of Viewer, \$6.75; Pola-Screens, from \$6.75.





A Kodak Close-Up Attachment gives you pictures like the one above at right

Move in on your subject this easy way— Slip an inexpensive Kodak Close-Up Attachment over your lens and you'll give your camera new picture-taking ability. You can "shoot" at closer range than is normally possible with a fixed-focus camera, and get big, clear images.

Use the attachment for head-and-shoulder pictures, close-ups of pets and flowers. The little story above shows you how easy it is—how pleasing the results. There are sizes to fit most Kodak, Brownie, and fixed-focus Cine-Kodak Cameras. Any size, \$1.63.

An inexpensive supplementary lens does wonders too

For extreme close-ups—Kodak Portra Lenses 1+, 2+, and 3+ give pronounced close-ups of subjects with both still and movie cameras. When you place one in front of your camera lens you step up its power for short-range photography of people, nature studies, and

table-top subjects. Kodak Portra Lenses are graduated in power as their numbers indicate. To secure even stronger effects, the lenses may be used in combination. A 2+ lens and 3+ lens combined give the effect of a 5+ lens. From \$2.59.



Normal Close-up

With Kodak Portra Lens 1+

With Kodak Portra Lens 2+

With Kodak Portra Lens 3+

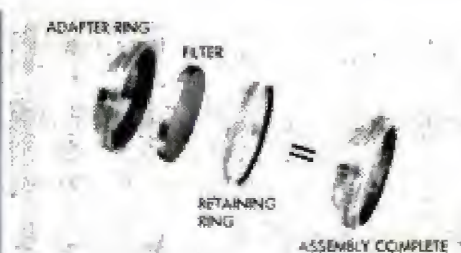
With Kodak Portra Lenses 2+ and 3+



Protect your filters this easy way—Kodak Combination Filter Cases are handsome leather cases that protect lens attachments and provide a convenient way to carry them. One compartment holds a Kodak Adapter Ring, Filter, Lens Hood; the second, three filters. Series V, \$4.25; Series VI, \$4.95.



Shade the eye of your camera—A Kodak Lens Hood helps to guard against light-streaked photographs by making it easier to keep sunlight from striking your lens directly. It also serves to reduce sky "flare" when pictures are side-lighted by the sun or by photo lamps. From \$1.65.



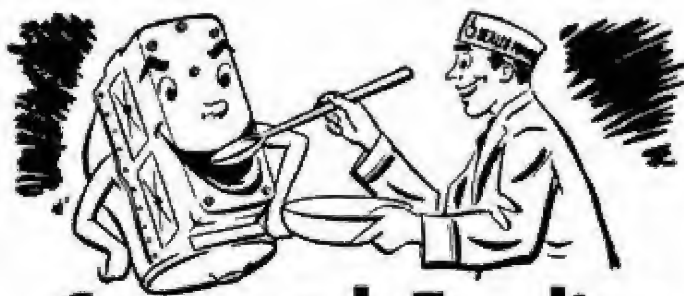
A single Adapter Ring accepts filters and other lens attachments—The two-element Kodak Adapter Ring is the basic unit of Kodak Combination Lens Attachments. Its nonrusting chrome plating matches perfectly the quality finish of your camera. Available in all series sizes. Prices start at \$1.29.

Your Kodak dealer is fitted by training and experience to give you valuable help in your hobby of photography. He'll be happy to "talk shop" any time.

Prices are subject to change without notice

EASTMAN KODAK COMPANY, ROCHESTER 4, N. Y.

Kodak



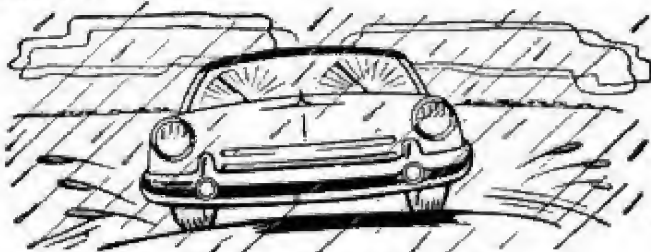
Care and Feeding of Engines

BY S. P. CORP

MAKE CHROME LAST LONGER

Chances are that calcium chloride or salt were used to melt ice and snow on your pavements last winter. Both have a chemical action on chrome plating. You may find your bumpers and other chrome parts pitted with small rust spots.

To improve appearance, and to prevent rust damage from spreading, borrow your wife's kitchen scouring powder and remove those rust spots. Then give all your chrome a coating of good wax. In fact, the chrome will last longer if you wax it every time you wash your car.



ROAD TAR AND OIL

Don't let spots of road tar or oil remain on the finish of your car. Use tar cleaner to remove them. If you use gasoline, be sure it's white gasoline—and be very careful with it. This is part of the thorough washing your car deserves. So is the job of washing away all salt accumulations under fenders, particularly where sheet metal is fastened together. Use a good polish to restore lustre, and don't worry if a little color shows on your polishing cloth—it is dead pigment, and is not a sign of damage.

CLEAN YOUR OIL PAN

Water always accumulates in the crankcase in winter. The wise way is to buy a set of oil pan gaskets, then drop the oil pan and give it a thorough cleaning. Clean gasket surfaces on both oil pan and engine block. Coat oil pan gasket surface with shellac, and, when tacky, place gasket on pan. Install all pan bolts before tightening any of them, to allow for movement in aligning bolt holes in engine block. Replace your oil filter at this time, too, so your new oil will have a fresh, clean start. Clean oil makes rings, bearings, and bearing surfaces last longer, and makes your driving a lot more fun.

USE SEALED POWER KROMEX RING SETS

Late model cars and trucks operate at higher engine speeds and higher combustion temperatures. Sealed Power KromeX Ring Sets are built for those conditions. Top compression ring and steel rails of oil ring have solid chrome faces to fight heat, friction, corrosion, abrasion! Write Dept. G-5, Sealed Power Corp., Muskegon, Michigan, for your free copy of the valuable new booklet, "More Power, Less Oil, Less Gas."



Here Comes the Circus

(Continued from page 87)

sockets in the canvas, then push the poles erect. Within 10 seconds the flat canvas oval has become a huge saucer.

A time-wrinkled elephant sways ponderously toward the tent, moves past the excited lad and lurches into the darkness until its bony head strikes the sagging canvas. The "bull man," with a touch of his hook, turns the animal around and hitches a rope to its harness. The hawser snakes along the ground, up the nearest center pole, around a pulley at the top and back down to the bale ring, where it has been tied off. Upon signal, the animal leans forward, testing the rope, then walks slowly out from under the canvas. The bale ring and canvas move up to "pull the peak."

The big top now has become a wrinkled, dark cavern, the quarter poles leaning at crazy angles, hundreds of men rushing about under the cloth roof. Elephants move sedately through the confusion, pulling each of the quarter poles into exact position. Standing on the edge of the tent, the kid leaps for safety as an elephant sways beside him, dragging an enormous plow around the perimeter, digging a ditch to drain the tent. Then the lad joins a crew of men who are "guying out" the canvas.

High up along the ridge of the big top, 60 feet above the boy, the "air conditioning system" has gone to work. On the outside of the tent, gigantic canvas flaps, 50 feet long, are trapping the slightest breeze, "breathing" up and down to pump cool air through the ridge vents. It's 20 degrees cooler under the top than it would be without the flaps.

Long before the last of the quarter poles has been pulled upright, riggers start weaving a web of tackle high above the ground, and cats claw seat wagons into position. There's an earsplitting clatter as ushers slam the seats erect.

The seat wagons have been called the foremost advance in equipment in the history of the circus. Each wagon is a big rectangular box, carefully pin-pointed under the edge of the big top, one end facing the center of the tent. Steel flaps, hinged along the top, hang down on both sides of the wagon. The flaps are swung up with jacks until they are level with the top of the wagon, making a broad platform. Then a Jeep, through a power take-off, turns a crank on the wagon, pivoting the entire platform on steel pins, the outer edge moving up, the inner edge moving down. The platform then rests at an angle with the lower end—toward the center of the tent—

(Continued to page 226)



just what fishermen ordered!

[AND MAN, HOW THEY'VE ORDERED IT]

FLEETWIN

7.5 O.B.C. certified brake H.P. at 4000 R.P.M. Price F.O.B. Factory, subject to change without notice,

\$210



IT'S FLEETWIN ... by Evinrude! It zoomed into the favor of knowledgeable fishermen the day it hit the water!

Its popularity rides up and up, for there's no motor like it. See how *much* of so many good things it offers you...

It's wonderfully *light*! Fleetwin weighs only a few pounds more than most "fives."

But... packed into those few pounds you'll find a noble bonus of *50% more power*. Power that whisks you to your fishing spots miles, miles faster. The smoothest, sweet-

est, sharpest power you've ever handled!

How about *trolling*? You couldn't ask for a finer trolling motor... for *this* one, owners will tell you, is *perfection*.

With Fleetwin's Duo-Clutch you've got "press-the-button" handling ease... you start in neutral, and "idle" anytime.

SEE YOUR EVINRUDE DEALER — let him give you a show-down demonstration of all that Fleetwin offers against the field! Look for his name under "Outboard Motors" in the yellow pages of your phone book. **CATALOG FREE!** Write today for catalog of the complete Evinrude line.



EVINRUDE MOTORS

4811 N. 27th St., Milwaukee 16, Wis.

IN CANADA: Manufactured by Evinrude Motors, Peterborough, Ontario

EVINRUDE

Here's how for Home Painters



How to paint your ceilings—Use small brush for edges and a lamb's wool paint roller. Roller eliminates dripping... applies paint 2 to 4 times as fast. Easier to see places you have skipped if you start near main source of light.

Why paint masonry?—Masonry surfaces absorb moisture like a sponge. This weakens cement and mortar. Soon cracking starts due to temperature changes. But painting with Bay State Brick and Cement Coating prevents this—reduces indoor dampness.



What to do with brushes between jobs—If it's just for a few days, bristles will stay soft wrapped in kitchen aluminum. For longer—soak brush in "keeping" mixture of $\frac{2}{3}$ raw linseed oil, $\frac{1}{3}$ turpentine. Wrap bristles in newspaper to stop kinking.

How to paint a window—Best bet is to hold strip of metal or cardboard on glass and against molding. Paint the wood, letting your brush lap over onto the shield. Shield protects glass pane efficiently. Best brush is an angular sash tool.



YOU can get all the painting accessories you need—and many more helpful tips—at your neighborhood Devoe dealer. You'll find his name listed in the classified section of your phone book. Why not stop in and see him at the sign of the Devoe diamond?



Clinic for Homemakers



As a service to our readers in solving the hundreds of problems pertaining to a home—inside or out—the editors of *Popular Mechanics* invite you to present your problems to The Clinic Editor for help and advice. Address your questions to The Clinic Editor, *Popular Mechanics Magazine*, 200 East Ontario Street, Chicago 11, Ill.



Restoring Organ Keys

Q—I own an old organ having genuine ivory keys, that is, the white keys are ivory. I believe the keys in the upper row are faced with either ebony or rosewood, I am not sure which. At any rate, the ivory keys are badly discolored and I would like to restore them to their original color. How can I do this without

damaging the ivory in any way?—B.R., Ky.

A—We do not believe you will find it practical to attempt restoring the keys to their original color. They can be bleached in several ways but we could not recommend the procedure as the results are not always reliable. However, grime and natural oils which accumulate and harden over long periods of time can be removed with a fair degree of success. One way is to make a fairly heavy paste by adding pure benzol to ordinary whiting. In order to apply this properly, it may be necessary to remove the keys one by one, replacing them in order after cleaning. Apply the paste, rub lightly and then rub off with a cloth or stiff-bristle brush before it hardens. (Caution: Do not apply the paste with the bare hands or rub with the fingers, as benzol is injurious to the skin. Do not permit the paste to come in contact with any of the finished parts of the organ, as benzol is one of the ingredients of paint and varnish remover. Avoid inhaling the fumes of the mixture.) After paste has been removed from the keys, rub them with a cloth which has been dampened in soapy water. Dry thoroughly before replacing.

Household-Tool Selection

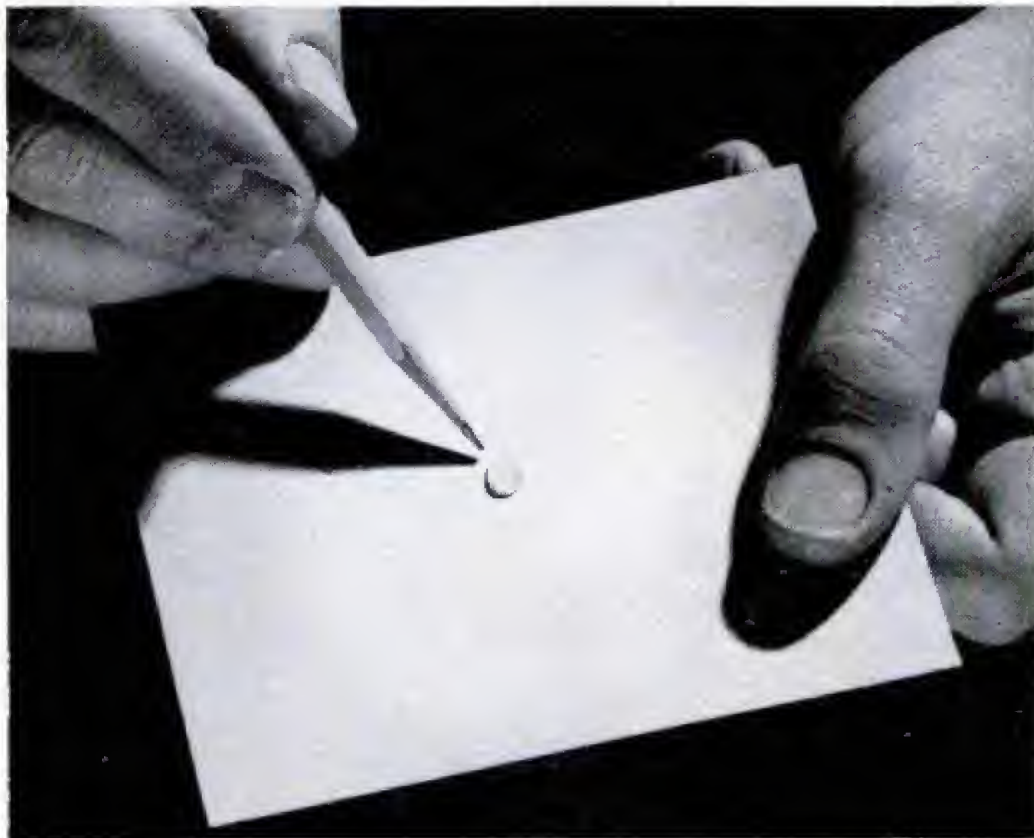
Q—I want to purchase a set of hand tools for household use. But what should I buy?—H.M., Calif.

A—Following is a list of hand tools selected on the basis of all-around home use but not necessarily calculated to cover every possible requirement:

Ripsaw, 26-in. blade (5 points per in.)	Combination square
Crosscut saw, 24-in. blade (12 points per in.)	Scriber
Compass saw	Miter box, 26-in. back- saw (optional)
Coping saw	Ratchet screwdriver
Hacksaw	Hand drill, $\frac{1}{4}$ -in. chuck cap.
Ratchet bit brace, 10-in. sweep	Oilstone, combination type
Auger bits— $\frac{1}{4}$ to $\frac{1}{2}$ -in. by 8ths or 16ths	Expansive bit, $\frac{3}{8}$ to $1\frac{1}{2}$ in.

(Continued to page 224)

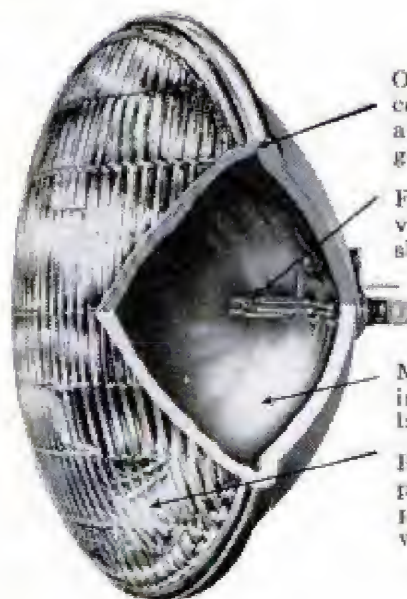
There is a difference in sealed-beam headlamps



...and this is it

All-Glass sealed-beam headlamps do not grow dim

When moisture collects inside a headlamp and deteriorates the reflector, it cuts light output. Unless your headlamps are All-Glass, you may be able actually to see traces of moisture inside. But there's one way to be *sure* your headlamps are not growing dim. Replace them with G-E All-Glass headlamps. Because they're *All-Glass*, all one big bulb, there's no way for water to get in. Tests show that General Electric sealed-beam headlamps average 99% as much light after years of service as when new. Be sure to specify G-E All-Glass headlamps.



One-piece All-Glass construction. Dirt and moisture can't get in.

Filaments held in vise-like grip. Can't shake loose.

Mirror-like, built-in reflector. Stays bright.

Rugged, hard-glass precision lens to put light where you want it.

You can put your confidence in—

GENERAL  **ELECTRIC**

NEW ATTIC FAN IS EASY TO INSTALL



COOL YOUR HOME THIS LOW-COST WAY

Why suffer through another hot, humid summer?

The modern Hunter Attic Fan will pull cool, fresh air through every room in your home . . . drive out scorching, sticky heat. It's quiet and powerful, requires little or no maintenance, costs only a few cents a night. And it's backed by Hunter's 65 years of fan experience.

You can easily install a Hunter Attic Fan in your home. This compact unit is complete with automatic shutter and modern metal trim to cover the ceiling opening. No suction box to build; no accessories needed. Fan requires only 17 in. attic clearance. Look in your classified directory and phone the Hunter dealer. You can have cool comfort at low cost.



MAIL FOR FREE BOOKLET

Hunter Fan and Ventilating Company
Box 2858-P, Memphis 2, Tenn.

Send a copy of "Change Your Home from Hot to Cool" to:

Name _____

Address _____

City & State _____

HUNTER ATTIC FANS

(Continued from page 222)

- Wood chisels, ¼ to 1-in. by 8ths
- Rosehead countersink
- Nail set
- Nail hammer, size No. 2, 13-oz. head
- Cold chisel, ½ or ¾-in.
- T-bevel, 8 or 10-in. blade
- Block plane
- Smooth plane, 8-in. frame
- Jack plane, 14 or 16-in. frame
- Level, aluminum frame, 18 to 24-in.
- Adjustable cabinet scraper
- Twist drills (fractional sizes) 1/32 to ¼-in. by 32nds

- 4 flat files with handles (selected according to requirements)
- Combination pliers (slip-joint, side cutting)
- Long-nose pliers
- Tinner's snips
- Ripping bar, 18 to 24-in.
- Marking gauge
- Folding rule, 72 in.
- Adjustable wrench (two sizes according to requirements)
- Pipe wrench, for pipe up to 2 in.
- Spokeshave

Cleaning Oil Painting

Q — I have an old and cherished oil painting which I would like to clean as it has become darkened and dingy in appearance due, I suppose, to an accumulation of dust and grime. But what solvent can I use to remove the grime without softening the oil paint?—V.H., N.D.



A—If, as you say, the painting is very old, then it is quite probable that the oil paints have become thoroughly oxidized and would not be damaged by careful use of a cloth dampened with pure turpentine. However, there is still some risk of damaging the painting by this procedure. It cannot be recommended without examining the painting closely to determine its condition. Although there are several methods of restoring old paintings, we have only one suggestion. Fold a soft cloth to make two thicknesses that will cover the painting. Dampen the cloth with lukewarm soft water and wring it until it no longer drips. Spread the doubled cloth over the surface of the painting and press it lightly into contact. Allow to remain for five minutes or so, then lift it off. Rinse the cloth and repeat the procedure. Several applications of the damp cloth should remove most of the accumulated dust from the surface. Then, if desired, you can brighten the painting by going over the surface with a tuft of cotton dipped in pure linseed oil. Wipe off any excess oil and protect the surface from dust until the oil coating is thoroughly dry.

Grindstone Repair

Q — I have an old grindstone of the treadle-drive type which I still use for grinding edge tools. It is a very fine grained stone but seems to wear out of round in a comparatively short time, making it necessary to true it up frequently. This practice is reducing the diameter of the stone at such a rate that soon I will have no stone left. Isn't there some treatment that will equalize the wear on the stone and at the same time not affect its cutting properties?—W.T., Pa.



A—Some users coat the soft spots of the stone with white shellac cut about 50 percent with alcohol. Before coating with the thin shellac in this manner, the stone must be clean and thoroughly dry so that the shellac will penetrate before drying. The shellac, in theory at least, tends to bind together more firmly the loose particles in the softer parts of the stone and thereby helps to equalize normal wear. An older treatment made use of raw linseed oil instead of shellac. One part turpentine is added to three parts raw linseed oil.

Get more **KICK** out of life!

Power riders get more ZING out of life — have barrels of fun. Never a dull moment — always something exciting to do — when you own a Harley-Davidson 125! Now's the time to get into this fast-growing sport and treat yourself to an endless round of thrilling good times with other throttle-twisters. See

your Harley-Davidson dealer — or send

us 25¢ for literature on the 1952

models and a copy of the

ENTHUSIAST Magazine filled with power-riding

action pictures and stories.

HARLEY-DAVIDSON MOTOR CO.
Dept. PM-5, Milwaukee 1, Wis.



Harley-Davidson ¹²⁵

WITH *Tele-Glide* FORK

Pointers for home painters **Windows:**

For a lasting job, remove all old or cracked putty. Hold tip of an electric soldering iron against putty until it is softened. Scrape out with putty knife.



Don't let your brush "fishtail" (see insert) by painting window frame with oversized brush. Use small nylon-bristled brush—one designed for the job.



Use a protecting strip of cardboard or sheet metal when painting near glass. Leave window slightly opened during drying, so it won't stick shut later.



Clean brushes with thinner after daily use. Suspend brush in thinner overnight. Bristle tips should not touch bottom of can. Work out thinner before repainting.

JOB AFTER JOB you'll get best results with a well-tipped nylon paint brush. Durable Du Pont nylon bristles paint smoother . . . are clean and sanitary . . . never get brittle . . . don't break off even under the roughest treatment. And nylon bristles last from 3 to 5 times longer than ordinary bristles. Leading manufacturers make nylon paint brushes in all types and sizes. Look for the name **NYLON** on the handle. Be sure to pick the size brush designed for the job . . . and demand Du Pont nylon bristles.

150th Anniversary



Better Things for Better Living
... through Chemistry

The best brushes have
**DU PONT NYLON
BRISTLES**

about four feet off the ground. "Seat men" now dive into the wagon, unloading supports and steel plates to build the "bible"—an extension right on down to sawdust level. Bolted to the platform are collapsible seats which are slammed upright. The seat wagons are so spaced that they form one vast arena seating 8000 people, the ring of seats broken only by the main entrance and by a few aisles through which the performers enter. The compartments beneath the seats then become dressing rooms for the performers.

Meanwhile, Edward "Whitey" Versteeg's 52-man crew of electricians has swept into the tent to erect the blinding banks of flood and spot lights. Versteeg has seven generators on wagons at strategic points. Seven miles of heavy cable lie coiled like spaghetti across the lot to light the 40-odd tents.

About eight hours have passed since the first section of the train backed onto the siding. It's 1:15 in the afternoon and, suddenly, standing on the edge of the cavernous tent, the kid sees the tip of the crowd break through the gate. He finally locates Werner, who slips him a pass, and he joins the crowd as it hustles to the best seats. Outside, big-top men are still tightening the ropes to a rhythmic chant heard nowhere else on earth. A few minutes later there's a brassy fanfare from the band and it's time for "the most prodigious production on the face of the earth, a superspectacle of stirring pageantry."

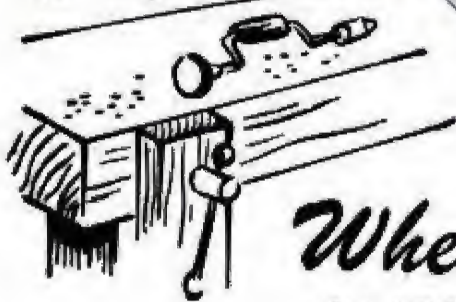
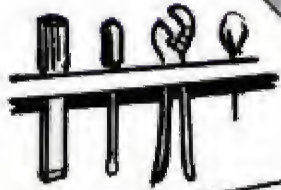
While the popeyed crowd watches the superspectacle, there's still a show to be seen out in the back yard. Tank wagons rumble across the lot, toting thousands of gallons of water for everything from elephant baths to pink lemonade. In the kitchen, cooks work on the evening meal. Late in the afternoon, just after the big performance is over and "lot lice" are trying to slip into the back yard without authorization, there's a lull—just about the only one during the hectic day. The performers, no longer bespangled daredevils, but ordinary folks from Oshkosh or Oslo, write letters, play with their children and drift over to the cookhouse for dinner.

But at 5:30, long before the overture for the evening performance, the kitchen already is packing its gear. You can feel an undercurrent of urgency around the cookhouse, too, and as the last kinker finishes his dessert the big tent already is echoing to the clatter of tables vanishing into wagons. About the time the "World's Biggest and Most Perfectly Trained Group of PERFORMING BEARS" touches off the evening performance, the cookhouse crew strikes its tent and heads for the train. Over

(Continued to page 228)

CHANNELLOCK *Belongs*

Made only by
CHAMPION DEARMENT!

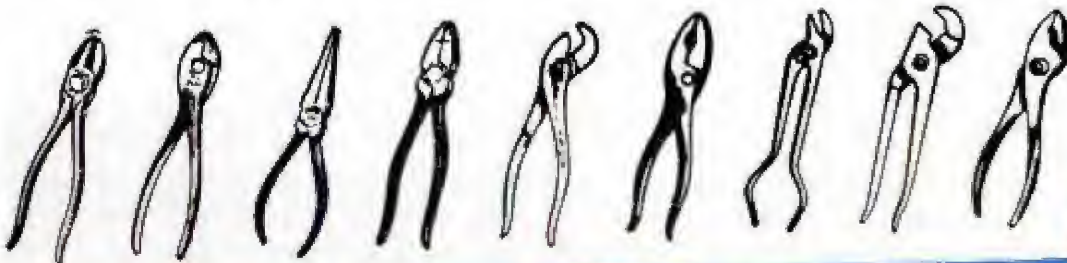


Wherever
PLIERS ARE USED!



When Mom or the kids get in a fixin' mood you can bet they'll do a better job when Channellock pliers are handy. Channellocks are easy to use, simple to adjust and—well, darn good pliers. They are made by Champion DeArment who for nearly 3/4 of a century have been making and selling highest quality tools. The next time you're shopping for tools ask to see Channellock pliers. Heft 'em, use 'em, test 'em—then buy 'em. On almost every job requiring tools, you'll find a use for Channellock. And remember, Only Champion DeArment makes Channellock. Send for Catalog Today.

CHAMPION DEARMENT TOOL CO., • Meadville, Pa.



Channellock pliers are listed in the Yellow Pages of most Telephone Directories under "Tools"



Only CHAMPION DEARMENT...

makes

CHAN NEL LOCK

TRADE MARK REG.

U. S. PATENT OFFICE

on the rail siding there's a steady parade of packed wagons moving up the ramps.

As animals and floats complete each act, they move out of the big top and keep right on moving to the trains. On the midway, the side show is collapsing and grab joints have vanished. By the time the performance has climbed to its brassy finale, the back yard is, once again, just a dark grassy field. Only the big top remains.

At 10:45, to the strains of the 28-piece band, 8000 spectators head for the exits, herded politely but firmly by the ushers. Elephants parade in at their heels and join forces with the tent crew to jerk most of the quarter poles. Six hundred men start tearing out the inside of the big top. Lights wink out. By midnight the tent is a vast ghostly cavern.

There's a quiet but sudden exodus from the big top. Six men stay behind, one beside each of the main poles. The canvas boss mutters "let 'er go" and the men loosen the tent at its peaks. It settles gradually, like a parachute. The six men have 45 seconds to reach the edge, but each carries a razor-sharp knife in case he should fall beneath the smothering folds. About 600 men rush in from every side, trampling the air out of the canvas and unlacing the 16 sections. Within 10 minutes the biggest canvas roof in the world has been torn apart

completely and rolled into neat bundles.

Whitey Versteeg has reeled up his cables with his line-winder by now, and most of the gear is packed aboard the trains. There's one floodlighted generator at the rail siding. In the midnight silence its big lights wink out. A cat wheels up and tows the generator up the ramps.

Somewhere in the distance a switch engine sounds a lonesome whistle. The train creaks and groans into motion.

Aboard *The Flying Squadron*, Lloyd Morgan nurses his midnight cup of coffee, wondering whether it will rain, as forecast. There's not much grass on the lot in the next town. Tomorrow may be a "soft," a muddy day, but he knows there'll be a sleepy 12-year-old waiting, rain or shine, to hit him for a job.

Paper Made of Glass

All-glass paper has been developed at the National Bureau of Standards and may prove especially valuable as an air filter in gas masks. In making the paper, fine glass fibers are mixed with water and formed into continuous sheets in a papermaking machine. No other raw material is used. The paper has been tested in gas masks and respirators. In the tests, only one smoke particle in 100,000 passed through.

I tried 'em all—
then I **BOUGHT** a **SAVAGE!**

That 'gunsmith' craftsmanship
really sold me!



Extra-
dependable
1.6 h.p.,
4-cycle Briggs
& Stratton
engine.

COMPARE the Savage Yard Chief with *any* other power mower on the market. You'll see instantly what a big difference genuine precision-manufacturing can make. Fine machining to closer tolerances gives you clean cutting and smooth, easy operation. Higher quality materials and extra-rugged construction assure you years

and years of service. Notice the tougher "Sta-Temp" blades. Totally enclosed chain and sprocket. Convenient finger-tip controls. External oil cups. The famous Timken bearings. Big traction-grip tires. It's a mower you'll be proud to own! Write today for free illustrated folder. Savage Arms Corporation, Lawn Mower Division, 99 Broadway, Chicopee Falls, Mass.

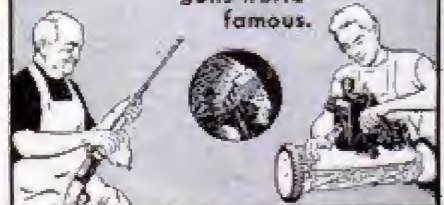
SAVAGE

21-INCH Yard Chief

SAVAGE Makes a Complete Line of Lawn Mowers for the Home. Ask your dealer to help you select the Savage hand or power mower best suited to your needs.

TRUE SAVAGE CRAFTSMANSHIP

Savage lawn mowers are produced with the same care and skill that have made Savage rifles and shot-guns world-famous.





Hose it —

MARFAK stays put, won't drip off!

★ This Hose Test is convincing proof of why *Marfak* lubrication lasts longer — does a *better* job of protecting your car's chassis. *Marfak* is specially compounded to withstand the "washing action" of rain, road water. That's mighty important this time of year. And bulldog-tough *Marfak* clings to points of wear and friction, resists jar-out, squeeze-out. As a result, *Marfak* lasts for 1,000 miles or more. And *you* enjoy "cushiony" driving that *lasts!* Get *Marfak* lubrication today. See your Texaco Dealer, *the best friend your car ever had.*



THE TEXAS COMPANY
TEXACO DEALERS IN ALL 48 STATES

Texaco Products are also distributed in Canada and in Latin America

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on TV every Tuesday night. See newspaper for time and station.

SELF-CONTROL STARTS HERE



and to restore CAR PERFORMANCE OIL-CONTROL STARTS HERE

To stop oil-pumping, replace worn engine connecting rod bearings

Worn engine bearings trap you between poor engine performance and high operating costs.

When main and connecting rod bearings are worn, your performance goes up in smoke! Worn bearings let excess oil reach combustion chambers, where it burns to performance-stealing carbon on pistons, rings, valves and spark plugs. Even new piston rings can't cope with these excessive amounts of oil for long. Give new rings a chance—check for worn engine bearings, too. Replace with Genuine Federal-Mogul Bearings, engineered for the job of oil-control. Ask your mechanic!

FEDERAL-MOGUL SERVICE
(Division of Federal-Mogul Corporation)
DETROIT 13, MICHIGAN



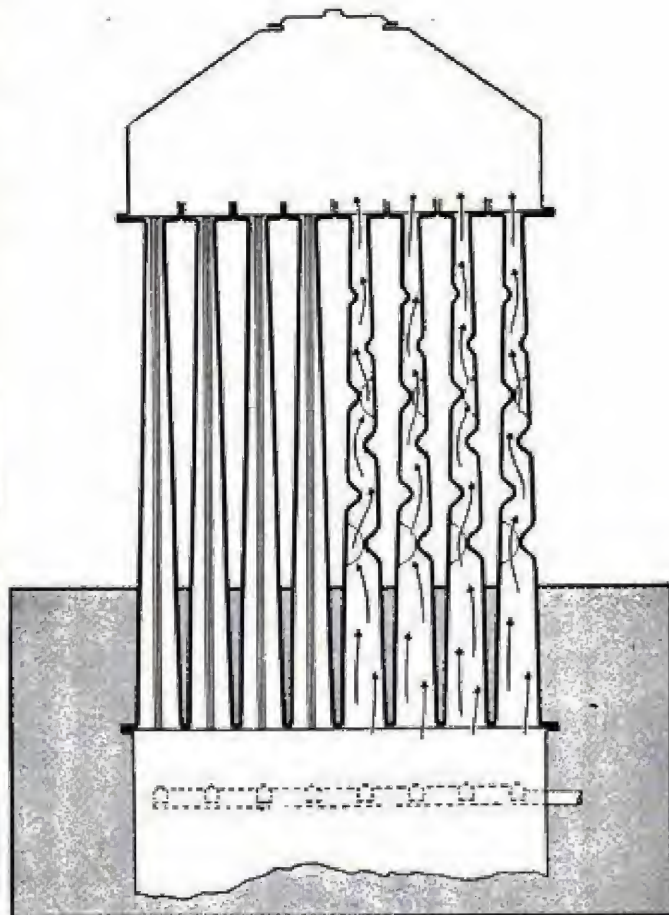
CONTROL OIL-PUMPING

WHERE IT STARTS—REPLACE WITH

FEDERAL-MOGUL

OIL CONTROL

BEARINGS



Wedge-Shaped Furnace Flues Increase Efficiency

Located directly over the burners, a series of wedge-shaped tubes forms the heart of a new gas furnace. As hot gases rise, they follow a winding path around indentations in the flue side walls, producing a "scrubbing" action which results in low fuel costs and long furnace life. Electric welding assures gastight operation of the furnace. The absence of baffles eliminates trouble from condensation. A large rectangular cleanout plate provides easy access to the interior of all flues.

Automatic Weather Stations

To find out how much rain is falling 60 miles down the valley from California's Shasta Dam, a Bureau of Reclamation man simply dials a number and an automatic weather station radios in a report. Six automatic rain-gauge transmitters are being spotted at critical points in the 4600-square-mile watershed south of Shasta Dam so reclamation engineers can prevent floods along the Sacramento River. When the transmitters report heavy rainfall, the flow of water from Shasta Dam is reduced at the proper time to provide channel space in the river for the rainwater. The rainfall readings are flashed on a screen at the Shasta power plant, where the flow of water into the river is controlled.



There's a **CRESTOLOY** **PLIER** for **EVERY** JOB

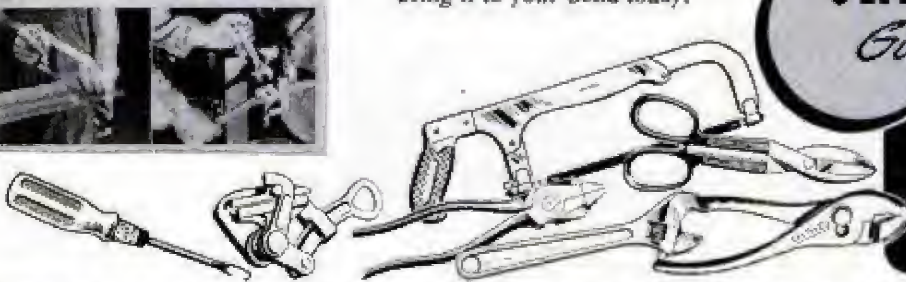
Here's Buster again . . . busting his thumb. The pliers he's using are good pliers but they're not made for heavy cutting. Perhaps he has learned a lesson and will send for a copy of "How to Use Hand Tools." His best bet however, is to look at the Crescent display board at his Hardware Dealer's. There he will quickly discover that the right tool for this job is a **CRESTOLOY** No. 2150 Lineman's Plier. It's light-weight but stronger, streamlined with hand-honed cutting edges. Ask for **CRESTOLOY TOOLS** at your hardware dealer.



**HOW TO USE
HAND TOOLS**

◀ **FREE BOOK!**

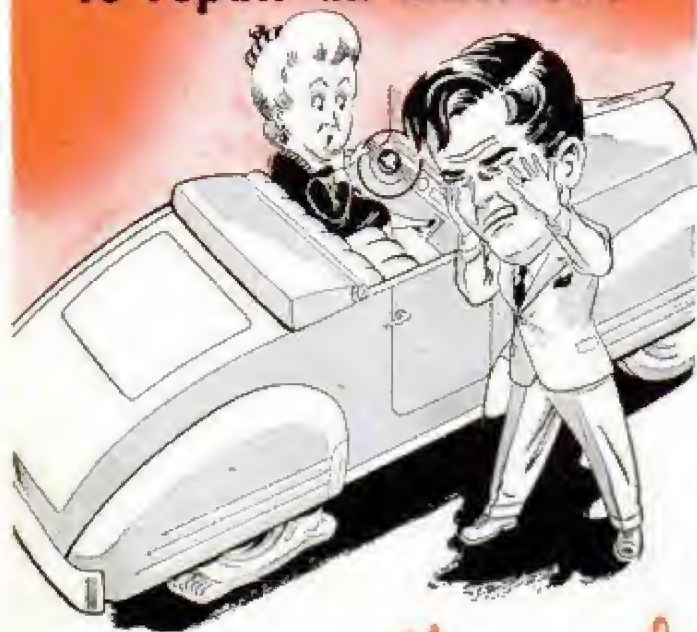
Has all the answers. It tells what tools to use and how to use them. Fully illustrated. A postcard will bring it to you. Send today.



*Sign of the Artisan
Symbol of Excellence*

Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by **CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK**

There is **ONE**
SURE, SAFE Way
 to repair an innertube



BOWES *Chemical* **PROCESS** **TUBE REPAIR METHOD**

● There are other methods of tube repair . . . the "cold patch" . . . the "vulcanized patch" . . . and . . . in most cases they work—but

**If You Want the ONE SAFE,
 SURE METHOD . . . Drive In
 Where You See BOWES
 This Emblem . . .**



● When you go to a station that displays the BOWES emblem, you are assured of *Sure, Safe* Tube repairs by the BOWES Chemical Process tube repair method.

Don't take chances . . . look for the BOWES emblem and be **SURE** of **SAFE** tire repairs.

BOWES "SEAL FAST" CORP., INDIANAPOLIS 7, IND.

The Richest Hole in the Mountain

(Continued from page 69)

To supply electricity for the mine, the Idaho Power Company had to string about \$1,000,000 worth of new lines across 99 miles of the mountain country from Montana. Linemen call a trail carved near the mine the "Burma Road." Under compression and with all brakes set, power wagons can go down, but only a mechanical "cat" can climb it.

A span of wire stretching across Panther Creek Canyon is almost a mile long—one of the longest spans in the world. Each strand of wire, 5/8-inch copperweld, had to have a special steel core so that it would withstand the weight and tension of the big jump across the canyon.

Improved telephone lines—and service—are on the way, but the mine is now on a 15-party line and officials must compete with lonesome wives of ranchers in the remote area for talking opportunities. The other day an important call from New York to the mine got tangled up with a conversation to the effect that "Uncle John's wife forgot to wash the milk cans, and he swore at her. . . ."

Deep snow comes early to Blackbird Canyon (elevation 6850 feet at the mine) and stays late. But snow didn't stop construction. Last winter, during building of the ore mill, men were kept busy with shovels and brooms merely finding pieces of steel delivered before the snow fell.

"The men wore two pairs of gloves," recalled Douglas, "but even three are pretty ineffective when you're handling steel in freezing weather."

Three winters ago the really big snow came. For 10 days, some 40 construction workers were marooned at the mine. The eight-mile stretch of road to the town of Cobalt was blocked as thoroughly as a blasted tunnel. All food, except beans, ran low. Arrangements were made to drop other assorted foods from the air when the mineworkers were cheered by the sight of a snowplow bucking up the canyon. They wouldn't touch beans for weeks.

But always the work at the mine went on. That is, except for last summer. Fire struck in the surrounding timber. All the men at the mine were called out to help fight it. Bulldozers, big cats, too. 'Round the clock for seven days.

Calera has now pushed the Blackbird's main tunnel 6400 feet back into the mountain. There are more than 20,000 feet of underground workings. About 28,000 feet of diamond-drilling has been accomplished.

Although demand for the mine's product

(Continued to page 234)

COMPARE FEATURES! QUALITY! PRICE!



\$46⁹⁵
Cash

Bench Saw with blade, miter gauge, rip fence, machine pulley.

ONLY \$5.00 DOWN

COMPLETE OUTFIT AS SHOWN

\$110⁰⁰ Cash Complete Bench Saw with motor, motor pulley, two side table extensions, power tool bench, tool light, and Power Panel.

ONLY \$11.00 DOWN ON EASY TERMS

SEARS
ROEBUCK AND CO.

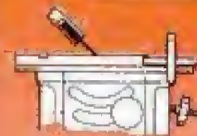


Table stays level, work lies flat bearings for all cuts



Double-row precision ball bearings; need no oil



Floating motor mount keeps proper belt tension

DUNLAP 8-inch ball-bearing TILTING ARBOR Bench Saw

REG. U.S. PAT. OFF.

We've made many comparisons . . . and we know of NO other bench saw of this size and type that equals it in quality, features and performance at this low price. It's one of the best power tool values we've offered . . . ever! And you can have it in your shop for only \$5.00 down on Sears Easy Terms.

—Tilting arbor lets you cut to any angle up to 45 degrees . . . while the work itself stays level. You can work faster, easier, and more accurately.

—Floating-drive motor mount supports motor behind saw . . . smoothes vibration . . . permits easier tilting . . . keeps proper belt tension. You can remove motor and use it with other power tools.

—Super-lubricated sealed precision ball bearings have larger oil chambers than are usually used . . . NEVER need further lubrication. NEVER get out of line. (They form integral unit with arbor shaft.)

—Improved fence design accurately squares fence directly against front of table. Can be used on either side of blade. Easily removed.

—17x14-inch table of cast semi-steel; top and sides machined. ONE lever locks fence at BOTH front and back! 8-in. combination blade (1/2-in. bore) gives up to 2 1/4-in. depth of cut. (Use at least 1/2-H.P. motor: 3450 R.P.M. with 2 1/2-in. pulley, 40-in. belt; or 1750 R.P.M. with 5-in. pulley, 44-in. belt.)

—Complete Outfit (as shown) includes CRAFTSMAN 1/2-H.P. 3450 R.P.M. ball-bearing capacitor motor (110-120 volt, 60-cycle A.C.); 2 1/2-inch motor pulley; 2 grid-type side table extensions; 40-inch belt; adjustable steel power tool bench; tool light; and Power-Panl (remote control for light, motor, etc.)

—Convince yourself! See this great DUNLAP saw value TODAY at your nearest Sears Retail Store.

These Accessories make your saw much more useful

A CRAFTSMAN 6-in. Dado Set. Dadoes, rabbets, grooves, etc., with 1/2 or 3/8-in. arbor bench saws. Set. **\$9.50**

B CRAFTSMAN Molding Cutter Head. Fits most bench saws with 1/2 or 3/8-in. arbors. 4-in. diameter. With Allen wrench. **\$4.50**

Cutter Bits for above molding cutter head. 1-in. wide bits cut styles as shown. Per set. **\$2.95** up

Your nearest Sears Retail Store will furnish you with exact selling prices which will not exceed O.P.S. ceiling prices.

C CRAFTSMAN 8-tooth Carbide-tipped Saw Blade. Costs you MUCH LESS than other carbide-tipped blades! Lasts 20 times longer than ordinary blades. Safer—8-tooth design eliminates kickback. Teeth project only .020 in. above non-cutting edge. Rips, crosscuts, miters. 5 1/2 to 10-in. diams. **\$10.85** up



CRAFTSMAN and **DUNLAP** Tools by **SEARS, ROEBUCK and CO.**
Famous for fine quality . . . precision performance . . . low price!

is "hot," the mine itself is cool. Average temperature is 48 degrees. And no pumping of water is necessary. All of which make for pleasant working conditions.

The ore is milled on the spot in a huge new plant. A refinery being rushed to completion near Salt Lake City will handle the concentrates shipped from the mill.

There were dark days before scientists obtained satisfactory concentrates. Floatability of the mine's cobalt is so nearly the same as that of its pyrite and pyrrhotite (iron sulphide), it did not seem possible at first to accomplish a separation of these minerals by standard flotation methods. A combination of roasting and floating was devised, but the combination raised the cost of operation, so research was continued.

Finally, in the spring of 1949, a company metallurgist working in the mine laboratory came up with the right treatment. The mine's ore yields twice as much copper as cobalt, but the cobalt is worth 10 times as much as the copper. There is also some gold, but no one seems the least excited about that.

Even in these days of labor shortages, Calera has had little trouble getting workers. The hunting and fishing in the area are a major inducement. There's no limit on the mountain scenery.

The new town of Cobalt is being planned

for comfortable pleasant living — not just living. The company-built homes are attractive, white bungalows, gay with green trim. Many miners are erecting their own homes under a self-help program. Employees are advanced up to \$2500 for the purchase of building materials and, when necessary, for skilled labor.

Already the town has a modern grade school, a clinic with two registered nurses in attendance, a volunteer fire department, Parent Teachers Association, Rod and Gun Club, Ski Club. Cobalt, as of July 1, 1951, replaced the "town" of Forney, which was really just a name on the map and a ranch house where the scattered residents of the area came to get their mail.

Residents of the new town, with all its modern touches from movies to home freezers, are still well aware that they are living on one of the nation's last frontiers.

Sawdust Useful as Mulch, But Nitrogen Must Be Added

Homeowners and gardeners may find sawdust and other wood wastes useful for mulching or soil improvement, say U. S. Department of Agriculture soil scientists. Addition of supplemental nitrogen will be necessary, however, to overcome the nitrogen-depleting effect of the sawdust.

DO IT TODAY! SWITCH TO

MILD

KENTUCKY CLUB

Notice how much better your pipe tastes—how much fresher your mouth feels when you switch to Kentucky Club.

Look for the blue tin with the picture of the red-coated rider. Send for free catalog showing fine pipes and how to get them at big savings. Mail Pouch Tobacco Co., Wheeling, West Va. Dept. 92



"Look! Another man switched to Kentucky Club—the thoroughbred of pipe tobaccos."



GET SET
for Summer!

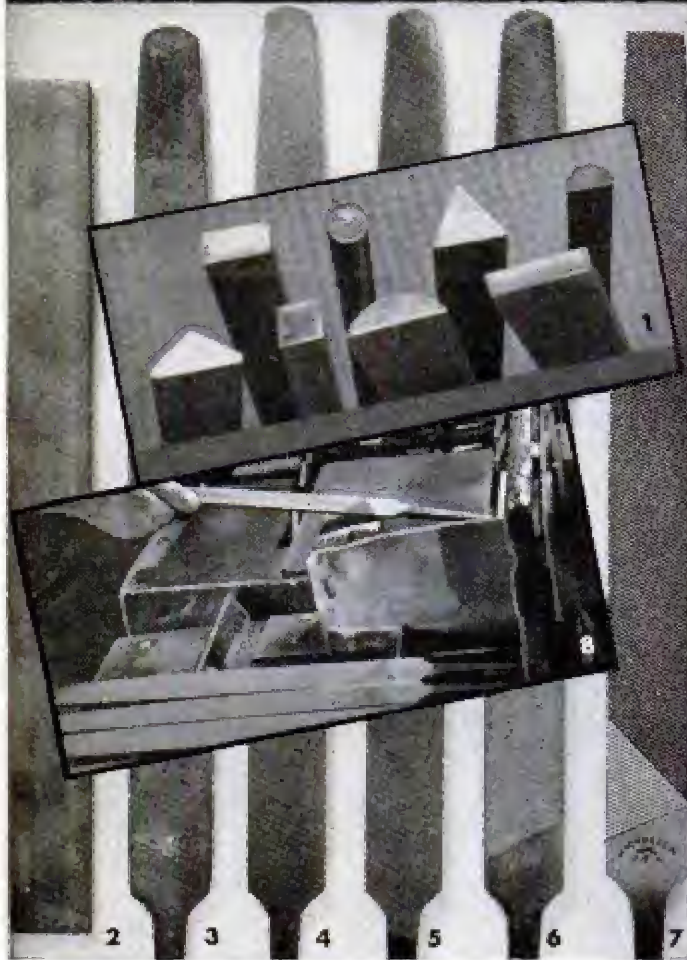
Install

AMERICA'S FAVORITE

CHAMPION

SPARK PLUGS

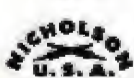
How a quality file is born



NICHOLSON file quality begins with steels (1) made to carefully determined specifications. . . . File blanks (2) are machine-forged to uniform shape (3). . . . For teeth cutting, blanks are annealed by precisely controlled heating and cooling (4). . . . Blanks are then straightened, ground to remove scale, precision-smoothed to assure teeth of even height and sharpness (5). . . . Teeth are cut by Nicholson-designed machines renowned for their accuracy (6). . . . A scientific process gives the teeth exactly the right uniform hardness—after which files are cleaned, further sharpened, tang-softened to prevent breakage, and oiled to prevent rust (7).

Every step of manufacture is checked. Furthermore, the finished files are given a series of final tests by trained inspectors (8)—after which these world leaders in quality files are ready for you to enjoy using. At hardware dealers everywhere.

FREE BOOK, "FILE PHILOSOPHY," tells lots more. Write.



NICHOLSON FILE COMPANY
22 Acorn Street, Providence 1, R. I.
(In Canada, Port Hope, Ont.)



NICHOLSON

A FILE FOR EVERY PURPOSE

Feathered Racers on the Beam

(Continued from page 121)

the fourth year. They often live 18 to 20 years.

The homing instinct of this feathered fraternity has ever been a mystery to man. A new owner must start with birds too young to fly or breeders which he keeps penned. Attempts to settle older birds in new homes have never been marked with success. The D'Angelos purchased a homer from a loft in Cuba and kept him for four years. One day he disappeared and two weeks later a letter arrived announcing that the bird, for which they had paid 175 pesos, was back home. Another bird, Big Red, whose home loft was in Hempstead, N. J., was conscripted by the Army and sent to Fort Crowder, Mo., where he was used for training younger birds. After serving faithfully for three years he went AWOL and turned up three days later back in Hempstead, 1600 miles away.

There has been a marked increase of interest in pigeon racing during the past few years. City dwellers especially have found that the small space required and the ease of feeding and raising make them an ideal hobby. They are clean and quiet enough not to disturb neighbors. A few yards of chicken wire covering a shallow shed built on the side of the garage, a sand floor and not much else are needed. Birds may be obtained from any fancier. Prices for breeders range from nothing to \$1000 per bird for championship stock depending on the purchaser, his position and intent. Many youngsters have started at no greater cost than lending a helping hand now and then to some near-by breeder. Young Johnny Perkins made a habit of dropping over to the D'Angelo house and helping clean out the cages. Tony made him a present of a pair of birds and now Johnny has a string of 45.

Pigeon hobbyists rave about the excitement of the sport. It has another characteristic that can't be denied: There is no other hobby that will stick to you like homing pigeons. They're like boomerangs. You can't throw them away!

Acid-Immune Metals

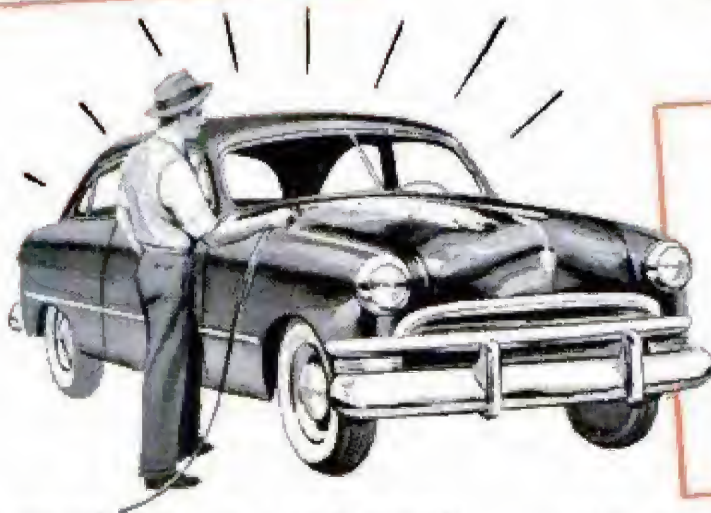
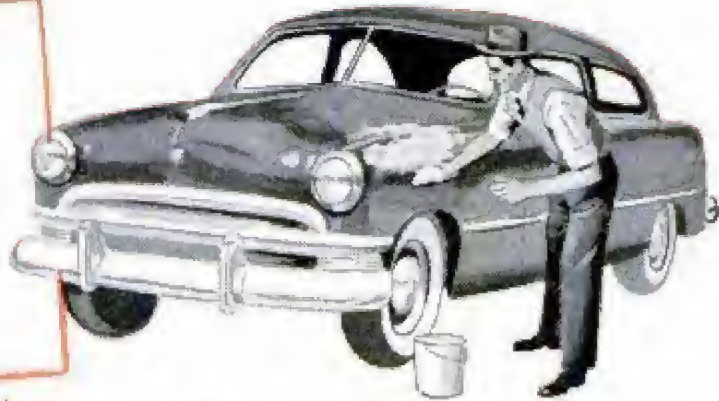
Immunity to sulphuric-acid damage is claimed for two new metals. Ferrolum is made by bonding lead and steel to combine lead's immunity to sulphuric acid with steel's strength. Copper's high electric conductivity and heat-transfer value are added to lead's acid resistance to form the other new metal, Cupralum.

Now... an easy way to wash your car

DU PONT CAR WASH

Floats away grime... saves you time

**JUST
SPONGE
IT ON**



**THEN
RINSE
IT OFF**
(AND LET IT DRAIN)

It's a wonderful new detergent... gets your car spotlessly clean

You'll never know how fast and easy it is to wash a car until you've used remarkable new **Du Pont Car Wash**. Just a tablespoonful in a pail of water produces a bucketful of fluffy foam. Then this ideal solution goes to work... makes the most stubborn dirt, grease and oil disappear in a wink. Simply rinse it away, let it drain, and your car will dry—with no streaks or spots! Next time, let Du Pont Car Wash make the job a cinch for you.



DU PONT NO 7 PRODUCTS

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

See it...before you
pay MORE!

GRAFLEX® *Ciro 35*



NOW ONLY \$44.¹⁵

Model R, as shown with f/4.5 lens
Model S, with f/3.5 lens \$49.05
Model T, with f/2.8 lens \$89.50
Prices Subject to Change.

The only range finder
"35" under \$50! Models R and S

The all-metal CIRO 35 . . . America's finest dollar-for-dollar value in candid cameras! Though packed with features to delight the experienced fan . . . it's as easy to use as an ordinary box camera. Coupled range finder helps prevent out of focus shots . . . and the CIRO 35 is the only camera under \$50.00 that boasts this wonderful aid! All models have coated lens; built-in flash synchronization; film counter; and scale focusing. See them at your Graflex dealer's!

GRAFLEX®
Prize-Winning Cameras

Graflex Inc., Dept. 91
Rochester 8, New York

Please send me details on the CIRO 35.

Name _____

Street _____

City _____

County or Zone _____

State _____



Vacuum-operated wipers stall when engine vacuum is cut on long climbs. Electric wipers are the answer

There's a Knack to Mountain Driving

(Continued from page 146)

to low, stamp hard on the accelerator. Shift immediately, then let up on the accelerator gradually. With fluid drive this procedure will step up engine revolutions to match the effect of the lower ratio.

Since most drivers will take a lot of downgrades in high gear regardless, they should know the tricks of better braking. As a General Motors engineer put it to me, a brake is simply a device for converting momentum energy into heat. And this heat can be a murderer. The expression "burned out brakes" is often heard after a runaway wreck in the mountains. With modern hydraulic brake systems it is usually a misnomer.

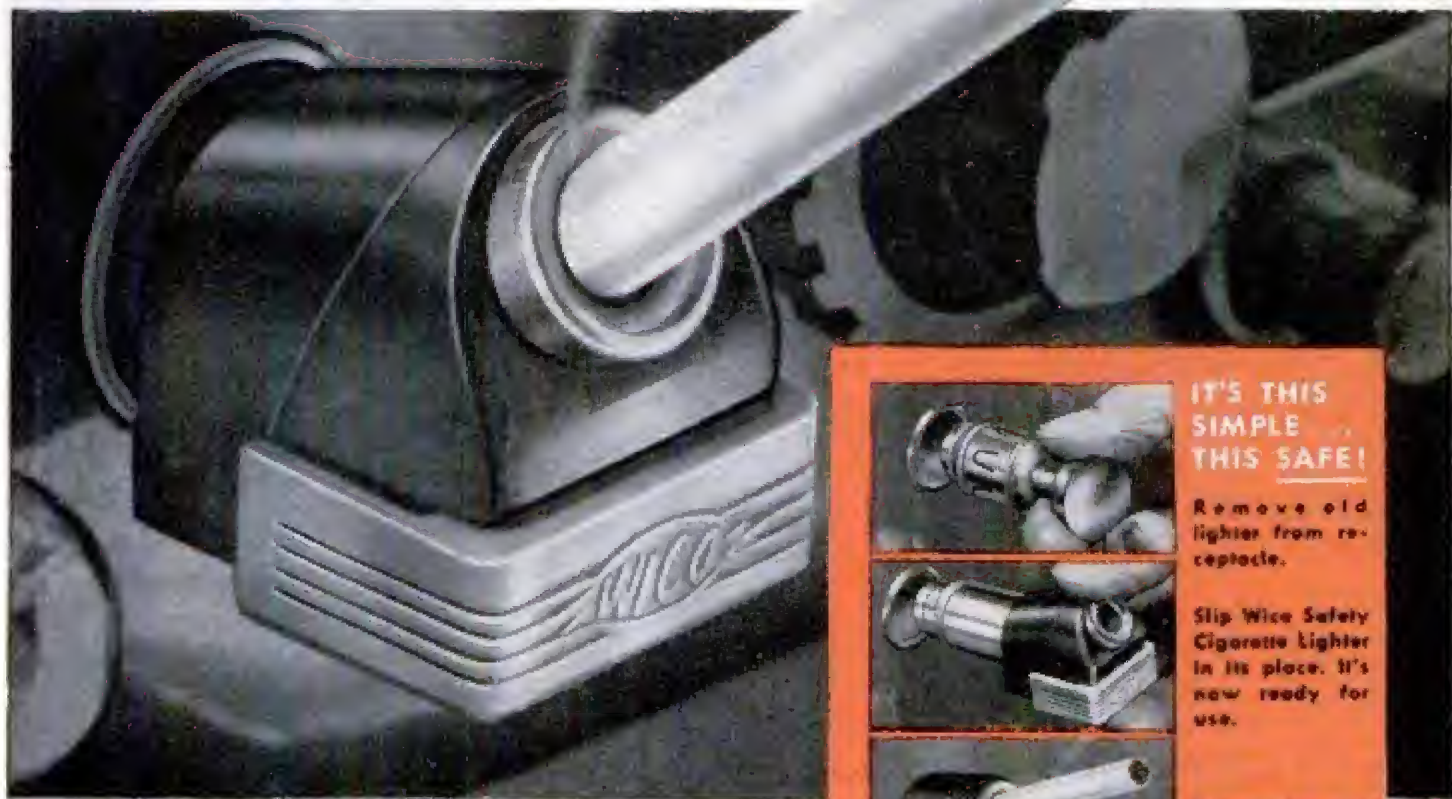
What happens more often when a driver "rides" his brakes down a long grade is that the heat from the brake drums actually boils the hydraulic-brake fluid in the wheel cylinders. Since the gas bubbles thus caused are compressible, the brake pedal may hit the floor board without taking hold. Even pumping the brakes may not help. Thus, on long descents it is much better to make a series of brake applications, allowing a time interval after each application for the heat to dissipate. If the brakes still get mushy with severe use, stop for a few minutes and let the system cool off.

It scarcely need be added that no car should be taken on a highway trip without having the brakes correctly adjusted to allow adequate reserve pedal travel.

Of course, before you can come down a mountain you have to go up it. Two typical

(Continued to page 240)

This automobile lighter could save your life!



TAKE your eyes off the road for a split second and *anything* can happen!

Yes, tragedy can take the wheel in *the four seconds it requires to light a cigarette*. Play it safe with the new Wico Safety Cigarette Lighter!

No need to take your eyes off the road ever! It lights your cigarette and takes the first few puffs.

The Wico fits into the present lighter receptacle of your car. No installation or new wiring needed.

ONLY
\$2.95

at auto dealers, accessory stores, gift shops, department stores, and gas stations. Or you can use the coupon to order direct from the factory. Get yours *today!*



WICO ELECTRIC CO.
WEST SPRINGFIELD, MASS.
*Producers of specialized fine ignition equipment
for more than 50 years.*



**IT'S THIS
SIMPLE
THIS SAFE!**

Remove old lighter from receptacle.



Slip Wico Safety Cigarette Lighter in its place. It's now ready for use.



Place cigarette firmly in the lighter.



Push plunger in for a moment pump once or twice.



Remove lighted cigarette and enjoy your smoke in safety!

**WICO ELECTRIC COMPANY
WEST SPRINGFIELD, MASS.**

PM401A

Enclosed is my check (or money order) for \$2.95. Please ship immediately Wico Automobile Safety Lighter for car _____ (Make)

(Year)

Name _____

Address _____

City _____ Zone _____ State _____

ORIGINAL AND STILL FIRST

1927



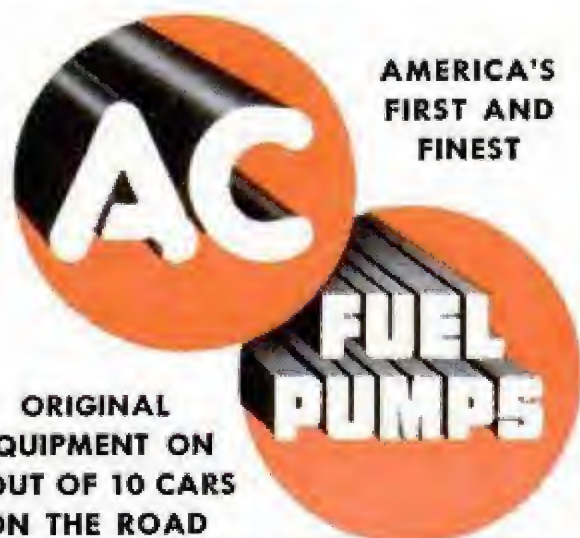
1952

It was back in 1927 when AC first offered to automotive engineers an improved method of supplying gasoline to the carburetor — AC Fuel Pumps.

They were so sound in design, so reliable in service, that they were adopted as the industry's standard.

More than 100,000,000 have since been built. Over 40,000,000 are in daily use.

This 25 years of leadership is evidence of the superior quality of AC Fuel Pumps — proof that there are none better.



AMERICA'S
FIRST AND
FINEST

ORIGINAL
EQUIPMENT ON
9 OUT OF 10 CARS
ON THE ROAD



AC SPARK PLUG DIVISION

GENERAL MOTORS CORPORATION

upgrade problems, fuel-pump vapor lock and radiator boiling, are also met with on the deserts which lie across many of the routes to our Western playgrounds.

In both instances heat is once more the enemy, this time from the engine. Typically, vapor lock in the mountains occurs after you have climbed a steep grade at low speeds and then stop to admire a view. When the car is cranked again, it either fails to start or acts as if it were out of gas.

Automotive engineers call this business of turning off a hot engine and letting it stand the "soak" test. They mean by this that carburetors and fuel pumps soak up heat from the engine block. The air under the hood may reach a temperature of 135 degrees F. after you stop on a hot day.

This is enough to vaporize some of the gasoline in your fuel pump or fuel lines. In the mountains this happens at a lower temperature because of the lower atmospheric pressure at high altitudes. Then a weak fuel pump cannot get a grip on the frothing stuff in the line and you're stuck.

The basic cure for this trouble lies in the hands of the auto engineers. They should locate fuel pumps in a cooling air stream and shield the gas lines. About all a car owner can do when caught with a vapor lock is to wait for the gasoline to cool off, helping it a little perhaps by pouring cold water over the fuel pump.

Occasionally at high altitudes another type of fuel-vaporization trouble occurs on hot days, usually while the engine is idling. The gas in the carburetor may boil and the resulting pressure forces extra fuel into the intake manifold. This trouble, called percolation, causes the engine to kill as though it were being choked. Best cure is to hold the accelerator to the floor while cranking the starter.

If you plan to drive your car consistently at high altitudes, it will pay to get smaller jets for your carburetor. These proportion the gas more properly to match the decreased oxygen in the air.

Overheated radiators as you climb a mountain or cross the desert can be avoided by forethought. Before starting a trip make sure your radiator isn't clogged, and that the fan belt is properly adjusted. With the car in good shape, boiling on a grade occurs chiefly from "lugging" the engine; that is, forcing it to pull grades in too high a gear. On the desert, cars sometimes heat up when you travel directly with the wind.

If the radiator does boil, use great caution in removing the cap to add water. Most modern cars are equipped with a pressure-type radiator cap which permits steam pressure to build up quite a head before the cap

(Continued to page 242)

You CAN Take It With You!

BECKER *Self-Contained* SPRAY GUN

NOTHING ELSE TO BUY

TAKE IT ANYWHERE—the first completely portable spray gun. Needs no compressor, motor, or electrical outlet. Pressure-powered with an inexpensive CO2 cartridge that sprays up to 21 liquid ounces, depending on viscosity. Extra cartridges, 10 for \$1, postpaid, or buy from your dealer.

PAINTS • VARNISHES • ENAMELS MOTH-PROOFS • INSECTICIDES

Every home needs a Becker Spray Gun for dozens of jobs in the house, workshop, garden or garage. Complete instructions furnished for effective results. Order yours today for the season ahead.

HOW TO ORDER—If your dealer can't supply, send \$15.95 and we ship postpaid—or \$2 now and pay postman balance plus postage and fee. Money back if not delighted after 5 days' trial.

SULLIVAN-BECKER CO.
Dept. 112-E, Kenosha, Wis.



ONLY
\$15.95
with 3
cartridges



Buick Fireball Engines are Protected by...



WITH

ALUVAC ELEMENTS

The only Oil Filter Element with all these Features:

- 1 **Microscopic filtration**—AC Aluvac removes sludge and particles as small as 1/100,000 of an inch.
- 2 **Maximum filtering area per cubic inch**—AC Aluvac has 10 times the area of ordinary elements.
- 3 **No harmful chemicals**—AC Aluvac won't destroy detergents in heavy duty oil.
- 4 **Acidproof**—secret process renders Aluvac material resistant to acid, gasoline and water.

There's an AC Aluvac Element to fit most every type of filter on any make of car.

AC SPARK PLUG DIVISION  GENERAL MOTORS CORPORATION

DRIVING COMFORT at its best!

The New *Electric Throttle*

With Foot Control

The Electric Throttle ("Speed-selector") sets whatever speed you choose electrically — releases instantly at a touch on the toe-button, or by applying foot brake. Banish foot and back strain for good! Install it yourself. Price, \$17.50 F.O.B. Check or C.O.D. Salesmen, Dealer and Manufacturer agent inquiries welcome. Give car, make, and year.

WRITE FOR DETAILS

D & M MFG. CORP., Anderson, Ind.



BUILD FINE GRANDFATHER CLOCK NOW

The simple sensible Red-Kut way as thousands have — **SAVE HALF. SHOP TESTED PLANS "SPIRIT OF THE CENTURY"** Narrow waist 8 1/2" tall or stately straight side **"SPIRIT OF AMERICA."** **EASY-TO-FOLLOW** photographs PLANS tell all—plus **BROCHURE** of heavy brass weight Westminster, tube chime, movements, porcelain dials, 3 1/2" solid mahogany case kits. Send \$1.00 today — Both plans \$1.50 NOW. **KUEMPEL CHIME CLOCK CO., 24 Kuempel Bldg., Minneapolis 16, Minn.**

BRIKCRETE



Local Manufacturers Have Broad Opportunities

Brikcrete manufacturers operate compact, self-contained plants under franchise privileges in protected territories. Each is an independently owned unit in a country-wide chain, using local materials and local labor to supply the world's most modern masonry for local building needs.

Brikcrete is rich in sales appeal because it is ahead in design, style, size, color, economy. Easily the preferred masonry. But because local production eliminates economic wastefulness,

Brikcrete can be sold at a lower-than-lumber price. Yet still allow a generous profit margin.

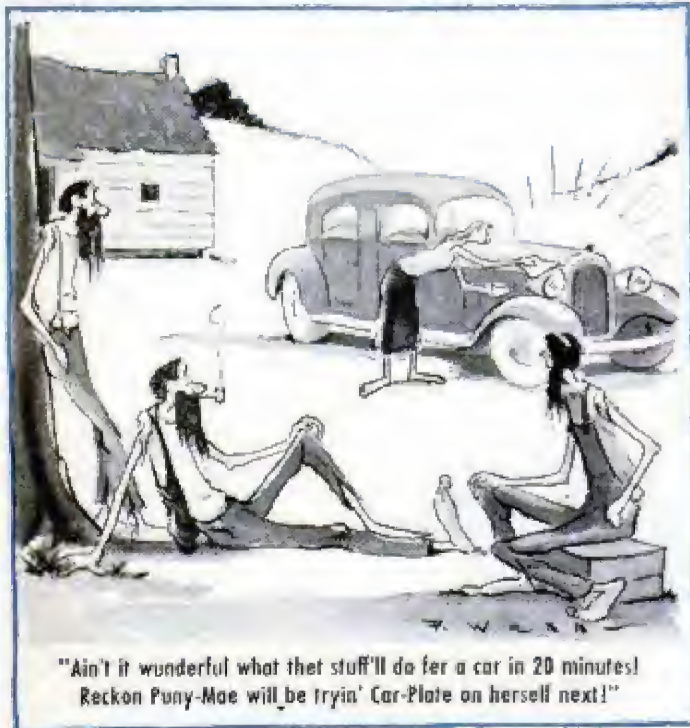
Brikcrete offers much to men looking for a community enterprise on a nominal investment. We supply complete equipment; easy terms when desired. Liberal cooperation. Write today for Brikcrete Book No. 2—while territory is still open.

BRIKCRETE ASSOCIATES, INC.

4679 Division Avenue, S.
Grand Rapids 8, Mich. 82



Yep...sure is easy
to give your car long-lasting wax protection!



Johnson's Car-Plate
Waxes any car in 20 minutes!



Spread it on—no rubbing—let it dry!
Wipe it off—no rubbing—that's all!

Johnson's Car-Plate is the no-rubbing auto wax described in Reader's Digest. It gives a brighter, longer lasting shine than even hard-rub professional wax jobs costing \$15 or more! Don't delay. Wax your car the easy way. Pick up a can of Johnson's Car-Plate today.



Clean first with Johnson's CARNU

The easy way to prepare the finish on your car for a Car-Plate waxing is to clean it super-clean with Johnson's Carnu. For exceptionally dirty cars, ask your dealer for Johnson's Heavy-Duty Cleaner.

Protect your car's chrome trim. Clean with Johnson's Chrome Cleaner—protect with Johnson's Car-Plate.

© S. C. Johnson & Son, Inc., Racine, Wis., 1962
**Johnson's, Car-Plate and Carnu are trademarks.

opens, allowing steam to escape with a rush.

Sudden changes in the weather in both mountains and desert should be anticipated. Fogs close in quickly in mountain passes. Either early or late in the season, snow may fall without warning. If you're planning such an off-season trip, carry a set of chains in the trunk.

When pulling up a heavy grade during a rainstorm you may find that vacuum-operated windshield wipers falter and stop as you bear down on the gas. If so, you can keep the windshield clear by releasing the accelerator at intervals. Cars with electric wipers won't encounter this difficulty.

On the desert, cloudbursts strike unexpectedly. Do not camp in a drywash or attempt to cross one in which there is any amount of water flowing during bad weather. To cool the car interior some drivers carry a chunk of Dry Ice. Since that leads to rolling up the windows, confining the fumes given off by the Dry Ice, safety authorities strongly advise against it. Use a pan of ordinary ice. Then, too, you can buy or make (see *Popular Mechanics*, May 1949, page 221) your own evaporation cooler to fit on a window. One of these will reduce the temperature of the dry desert air 10 to 20 degrees. You can also obtain a device which is a sort of secondary radiator to aid in cooling the engine.

But, as American Automobile Association touring advisers in the West emphatically told me, the modern car needs no special equipment on the main-traveled highways in either desert or mountains. However, one of them also told me that he never crosses the Great Salt Lake Desert without carrying one gallon of water—in canteen, Thermos or water bag, and a spare fan belt. Always check your spare tire too, he added, which is good advice on a highway trip just about anywhere.

see
pg.
142

Planet Bumped Moon Long Ago

Some 100,000 years ago, a minor planet about 125 miles in diameter collided with the moon and exploded. Big chunks of matter, thrown violently in all directions, ripped long grooves in the lunar landscape. According to Dr. Harold C. Urey, Nobel prize winner of the University of Chicago, this collision produced Mare Imbrium, the best known of the "seas" of the moon. Actually, these flat formations are not seas at all but vast dry plains. Doctor Urey believes that the collision occurred in the last days of the moon's formation.

☐ Lubrication oil synthesized from natural gas is being tested in 57 cities, and may solve many lubrication problems.

THIS ONE-TWO PUNCH

adds power—pep—miles
in auto performance!

- K.O.'s top-cylinder wear
- Frees sticky valves
- Defeats gum formations
- Provides ring seal

1 MARVEL INVERSE OILER

Tested and proven through years of scientific research. Now available in one quart model. Visible oil reservoir feeds oil automatically in proportion to engine needs direct to upper cylinder area. Install a Marvel Inverse Oiler for better motor performance, longer engine life . . . more engine-hours per dollar!

2 MARVEL MYSTERY OIL

A specially developed top cylinder oil for today's high compression engines. Ideal for use with hydraulic valves. Contains no ingredients or graphites harmful to engines. All-around lubricating action insures smoother, carefree driving . . . protects and adds years to the life of your car.

*Be engine wise . . .
Marvelize NOW!*

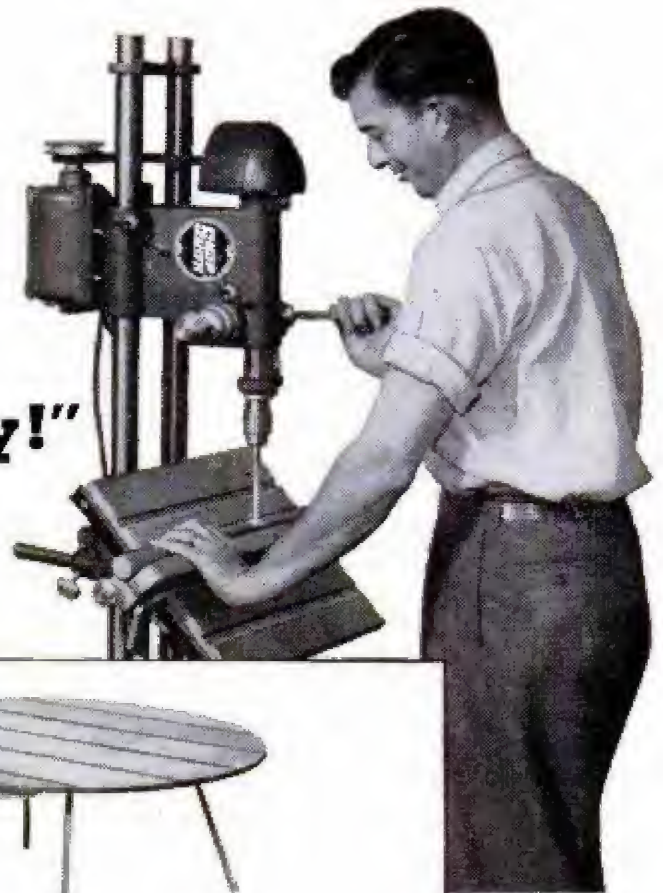


For detailed information,
ask your dealer or write:

EMEROL
MANUFACTURING CO.

DEPT. 117, 242 West 69th St.,
New York 23, N. Y.

**"SHOPSMITH makes
the toughest jobs easy!"**



"I'll match SHOPSMITH against any power tool for regular performance. In accuracy, capacity and quality of construction, it ranks with the best of them. And when it comes to difficult or unusual operations, like cutting out a circular table top or drilling into the ends of boards, SHOPSMITH has no equal!

"Take the garden furniture I just made, for example. The frame for the chair is doweled and glued. You can see that tricky angles were involved. With any other drill

press, drilling holes for the dowels would have required complicated jigs. But not with SHOPSMITH. I just set up SHOPSMITH as a horizontal drill, laid the work flat on the table and fed the drill in from the side. Saved myself a couple of hours on that one operation alone.

"All the way through, SHOPSMITH's flexibility made the tough jobs easy. There's hardly a sawing, sanding, drilling or wood-turning job that can't be done faster and better with SHOPSMITH!"

SHOPSMITH is a complete power workshop . . .

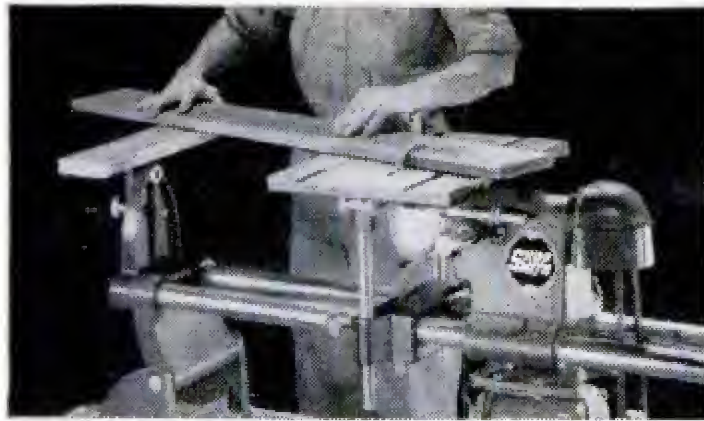
- 8" circular saw • 12" disc sander
- 33" wood lathe • 15" drill press
- Horizontal drill

SHOPSMITH complete **\$189⁵⁰**
except for motor* . . .

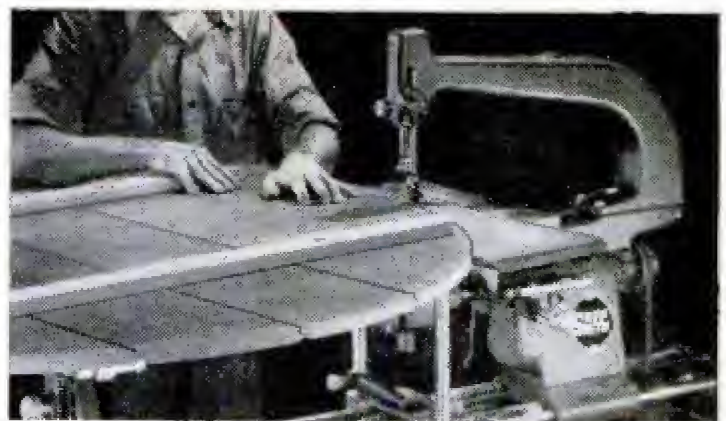
*Special 1/4-hp., capacitor-type,
120-volt, 60-cycle motor. . . **\$34.50**



SEE SHOPSMITH DEMONSTRATED AT LEADING HARDWARE AND
DEPARTMENT STORES OR ANY MONTGOMERY WARD STORE.
WRITE FOR FREE SHOPSMITH CATALOG



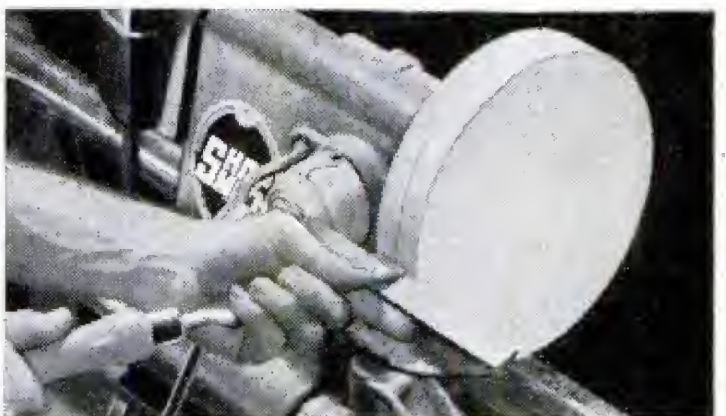
1 "BIG TABLE. SHOPSMITH'S table extension and extremely accurate miter gauge make it easy to cut long boards to precise lengths and angles. Table area (with extension) exceeds that of many expensive production-type table saws."



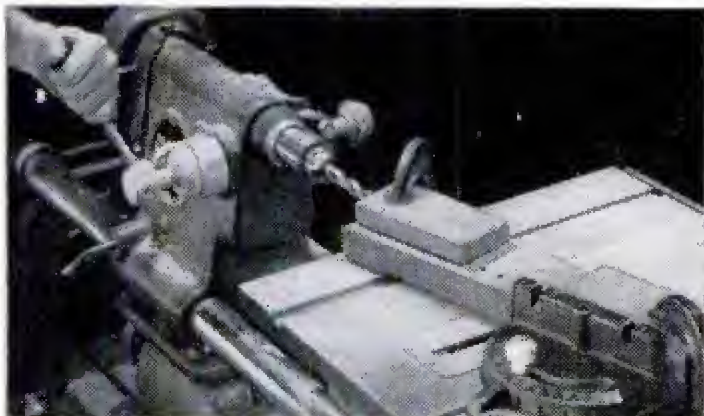
2 "ROUND TABLE TOP was cut with SHOPSMITH jig saw (\$34.95). It was a simple operation. I used the SHOPSMITH lathe center as a pivot and supported it with the table extension and rip fence. With this ready-made jig, the job was a cinch!"



3 "SMOOTH SANDING. It was just as easy to sand the edge of the round table top. Using the same pivot setup, I simply substituted the sanding disc for the jig saw. By rotating top slowly, I got a perfect circle and a beautifully smooth, right-angled edge."



4 "DUPLICATE TURNING. The wheels for the chair were turned together on SHOPSMITH in the lathe position. The things I like about the lathe are its big capacity (15" swing, 33" between centers), its time-saving sliding tool rest and its rugged precision."



5 "END DRILLING. The framing members for the chair were end drilled for dowels the easy way—with SHOPSMITH set up as a horizontal drill. This exclusive SHOPSMITH feature is a real time-saver. More important, every joint fits perfectly!"



6 "ROWS OF HOLES. Here's another case where SHOPSMITH not only saved me time but did a better job. To drill lacing holes in the chair frame, I used SHOPSMITH as a vertical drill and used the rip fence for a guide—an easy, natural way to align holes."

MAGNA ENGINEERING CORPORATION
Dept. 197-B
at factory nearest you:
12819 Coit Road, Cleveland 8, Ohio, OR
Menlo Park, California

Please send me free 16-page SHOPSMITH catalog.

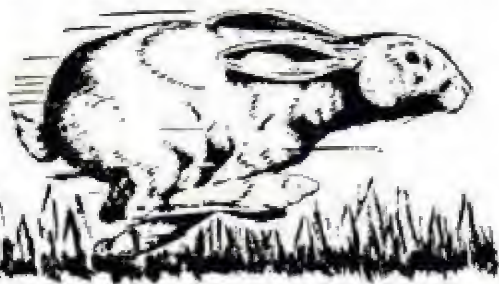
Dept. 197-B

Name _____

Address _____

City _____ State _____

for FASTER FIREPOWER...



shoot a **WINCHESTER** Model 63

The speed and firepower built into the rugged Winchester Model 63 can make the difference between a miss and game in the bag. The proven, semi-automatic action gives you shot after shot as fast as you can pull the trigger. Chambered for either SUPER SPEED or SUPER-X 22 Long Rifle cartridges, the Model 63 has a 10-shot magazine capacity for long-run shooting and has the grace and balance to make it easier to get on target and stay on target. Ask for the Model 63, it has a 23" barrel and weighs 5½ lbs.



Products of  Industries, Inc.

MAKE YOUR SELECTION FROM THE COMPLETE LINE OF

WINCHESTER

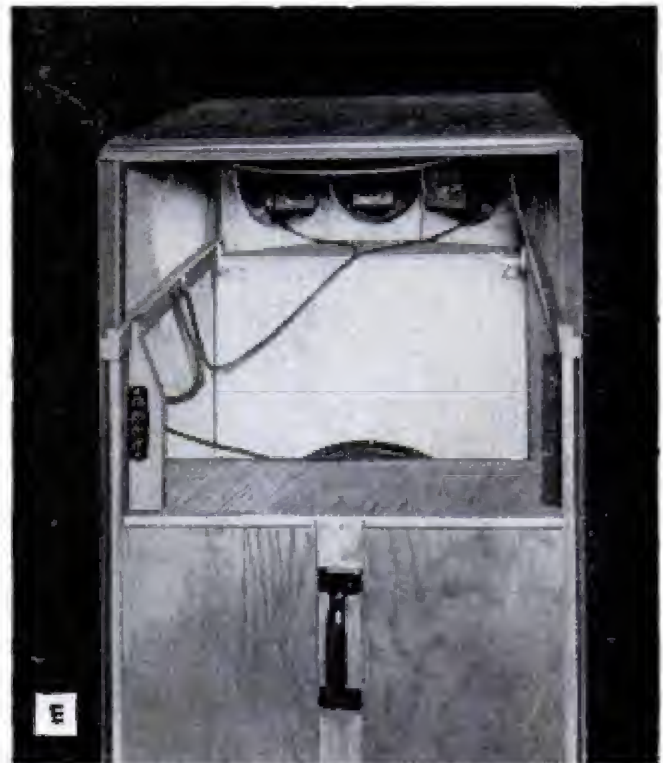
TRADE-MARK
22 RIFLES

FREE! Colorful folder about all Winchester 22 Rifles. Address: Dept. 43B, Winchester Repeating Arms Company, Division of Olin Industries, Inc., New Haven 4, Connecticut.

Two-Way Loudspeaker System With Lifelike Sound Reproduction

(Continued from page 213)

speakers specified is justified. The woofer is a single heavy-duty 12-in. PM speaker, front-loaded with a specially designed resonator and folded to conserve space. Most



of the construction material is ¾-in. plywood. Braces give the stiffness of much heavier material. Wire nails and glue are used to make the joints airtight. Use water-resistant casein glue mixed with very little water. Incidentally, do not place this speaker system in operation until a day after assembly. Use large round-head wood screws to fasten the woofer securely. Lock washers are an added precaution against loosening caused by vibration of the heavy bass response. Note the vertical braces, items 6, 7 and 8, placed centrally between the sides, item 1 in Figs. 1 and 2. Also note the angles on items 15 and 16, the tweeter mounting boards. Some home-workshop saw tables show 0 deg. when the saw is set to cut 90 deg. You should cut a scrap piece and check the angles before making items 15 and 16. Fasten the tweeter assembly to item 2 (see Figs. 1 and 2) with wood screws, using a short-handled screwdriver.

Detailed construction diagrams appear in Figs. 5, 6, 7, 8 and 9. The suggested trim, shown in Fig. 9, is black walnut, but any close-grained hardwood is acceptable. In applying trim, observe that the woofer "mouth" should be a full 4½ x 14½ in., as indicated in Fig. 2. Do not run the trim into

(Continued to page 248)

You can raise 8 Tons



*With a Twist
of your Wrist*

PERMA-JACK'S Easy Action Corrects Sagging Beams Quickly!

You don't have to be a circus strong-man, Perma-Jack's slick-working Timken thrust roller bearing makes the job easy. Floors squeaking in your homes, beams sagging?—stop the squeak, stop the sag—bolster them with a Perma-Jack—America's top-quality floor-leveling post with the five exclusive features. Capacity rated at 8 tons, but independent testing laboratories put a stress of 12 tons on Perma-Jack before it showed the first sign of paint cracking.

Here are the five exclusive features that make Perma-Jack best:

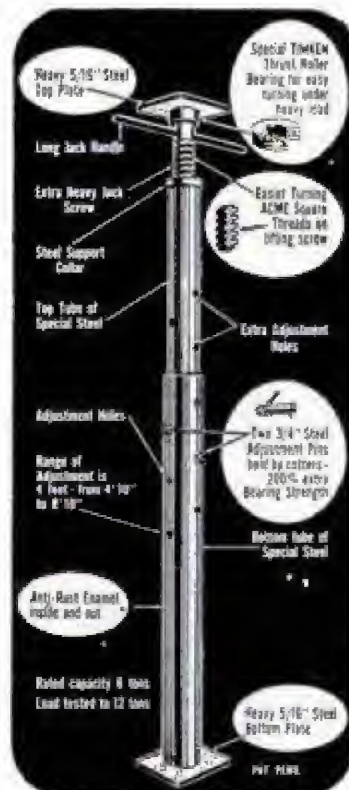
- 1 Easy-Action Timken Roller Bearing
- 2 Easy-Turning Acme Square Screw Threads
- 3 Extra-Heavy Top and Base Plates
- 4 Two Extra-Heavy Support Pins
- 5 Anti-Rust Baked Enamel Finish Inside and Out



A postal card brings you this illustrated folder showing how easily Perma-Jack is installed.

FREE

Write Today



Thousands of Perma-Jacks in use—two sizes fit every need. (Perma-Jack 4'10" to 8'10" —Perma-Jack Special 21" to 36".) Protect your property value, stop beam sags, squeaking floors, plaster cracking—see and buy Perma-Jacks at your neighborhood hardware or building supply store today.

PERMA-JACK CORPORATION 1111 EAST 200th STREET
CLEVELAND 17, OHIO

How to get more mileage out of your motoring dollar



WATCH TIRE PRESSURE

Check your tires while they are cool. Recommended tire pressure is based on ordinary outdoor temperature . . .

takes into account heat generated in running. For correct pressure—check tires *before* long drives.

Re-gap spark plugs regularly.

No engine performs efficiently if plugs fail to deliver a consistently full, hot spark. Worn plugs may increase gas consumption as much as 10%. Good, economical practice is to check gap every 5,000 miles . . . install new plugs every 10,000.



KEEP SPARK "HOT"



MAKE THIS SIMPLE TEST

Check your oil filter this quick and easy way. When the engine is warm—feel the outside of the filter housing. If it's cool, filter is probably clogged . . . can't trap any more abrasives and sludge. Next step is to get in a new

Purolator Micronic* Refill. Purolator's accordion-pleated plastic-impregnated element provides up to 10 times more filtering area . . . removes abrasive particles as tiny as .000039" in diameter from your engine's oil stream. Yet a Purolator* Refill costs as little as \$1.60. Takes just a few minutes to install.

*Reg. U. S. Pat. Off.

Check your oil filter every time you change your oil

PurOlator
(ENGINEERED FOR EVERY MAKE OF CAR)
Micronic OIL FILTER



this opening. A good place to install the grille cloth is under the trim. Do not use steel wool for finishing because particles of steel may get into the fields of the PM speakers.

The main idea of the final network, photo B and Figs. 10, 11 and 12, is to get a maximum of low-frequency energy into the woofer. The parts specifications for schematic circuit diagram Fig. 10 are given above on Fig. 8. Enameled copper wire is preferred for the coil; single cotton-covered is next in preference. Make the coil sides of $\frac{3}{8}$ -in. plywood, 1 in. larger than the coil's outside diameter. The center can be a cardboard tube. A few small brads will hold the tube to the coil sides. Use as little metal as possible near the coil. The coil can be held by two washers and a bolt for winding in either a lathe or hand drill. However, it also can be wound when held in the hand. Wind the wire in layers using tape between the layers, both to hold the turns and to make a neater following layer. The exact number of turns is not critical. The high-note control, Fig. 10, is necessary because of the high efficiency of the tweeters. As you play this assembly for the first time, you will be satisfied with a setting of half or less of the high-note control, R_2 . Later, as you become used to high fidelity, you will probably want more of the clear high tones. The woofer can be switched in and out by means of the single-pole double-throw switch, S_1 . Potentiometer control of the woofer is not recommended. This network unit is placed near the amplifier and is connected to the speaker system by means of cabled leads Q, QQ and X-ground indicated in Fig. 10. These cabled leads run to a terminal strip on the rear of the enclosure unit, photo E. When wiring circuit Fig. 10, note that only the positive (plus) connections of a dual electrolytic condenser (C_1) are used. Do not use the common negative. If separate electrolytic condensers are used, connect the negative leads together, but to nothing else. Paper condenser C_2 improves the high-frequency response. This network connects directly to the amplifier output; it will work satisfactorily with either the 8 or 16-ohm standard-impedance tap on the audio-amplifier output. The standard impedance of the five-in. tweeter speakers is four ohms. With the three connected in series, phasing is very important, see Fig. 11. Connect them in series for testing with a $1\frac{1}{2}$ -volt dry cell and note the motion of each speaker cone; they must all move the same way if they are phased properly. Detailed student material list R-409 is available from Popular Mechanics Radio and Electronics department upon receipt of ordinary letter postage.

GROBAN'S WAR SURPLUS SPECIALS!

PREPARE NOW ALL BRAND NEW • FULLY GUARANTEED IMMEDIATE DELIVERY

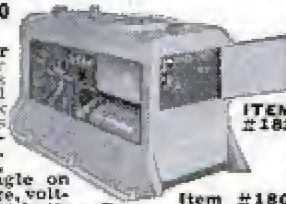
For Summer Power Supply • Brand New • Large Stock • Many Sizes

GENERATING PLANTS

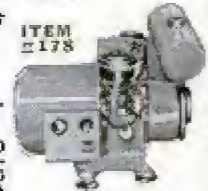
FOR • COTTAGES • CAMPS • HOUSE TRAILERS • CONSTRUCTION • ROAD BUILDING, etc. Plenty of emergency stand-by or general utility power from 350 watts to 25 KVA.



ITEM #183
3000 to 4000 WATT GENERATOR SET
 FEATURES—Power for your home or business. Simply connect to power panel or house circuit. • Constant voltage regardless of load. • Push button start or stop. • Easily made full automatic start or stop. **SPECIFICATIONS**—Sizes 19" x 30" x 48". Steel skids, weatherproof housing, requires no building. Wt. 725 lbs. • Hercules 4-cyl. 10 HP gasoline engine. Load governor. Oil filter. Quiet muffler. 4-volt starter generator. • Hobart 115 volt, 60 cycle, 3,000 to 4,000-watt generator. Furnishes either single or three-phase power, 2 or 3 wire. • Panel contains oil gauge, voltmeter, ammeter, circuit breaker, voltage regulator, start button. Today's Cost Over \$1,200.00. **SALE PRICE.**
 F.O.B. Chicago. **465.00**

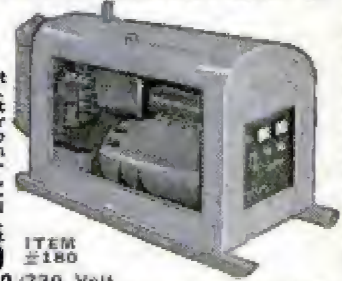


ITEM #178
350 watt—110 volt—60 cycle A.C. direct coupled to 1 cylinder Midco engine. Shpg. Wt. 116 lbs.
 F.O.B. Chicago. **125.00**
ITEM #182—Onan Generator—3KW—120 volt—60 cycle A.C. single phase, direct coupled to Ford 4 cylinder, water cooled engine with push button start, battery ignition. (Battery not included.) Shpg. wt. 1200 lbs. F.O.B. Chicago. **795.00**



ITEM #199—Power Unit PE-99—7.5 KW—120 Volt—Single and 3-Phase—60 Cycle A.C. Master generator driven by a 4 cylinder V-type, air cooled, Wisconsin engine with magneto ignition, push button start. The self-excited, drip-proof generator is driven from 3 parallel V-belts. Control panel contains engine and generator instruments, including circuit breaker, emergency start-stop buttons, volt meter, ammeters. Complete semi-enclosed unit mounted on steel skid. Weight 1885 lbs.
 F.O.B. Chicago. **945.00**

ITEM #180—15 KW—127/220 volt—60 cycle AC—3 phase 1800 RPM. Branca & Krachy Generator direct coupled to International Harvester 4 cylinder, water cooled engine with magneto ignition—push button start. Panel has voltmeter, ammeter, 4-wire electrical system, belt driven exciter generator, rheostat voltage control. Engine and generator mounted on steel skids. Shipping wt. 2000 lbs. (Battery not included.)
 F.O.B. Chicago. **1650.00**
ITEM #201—PE 95-G—110/220 Volt 60 Cycle A.C.—Single Phase. Totally enclosed, Onan generator direct coupled to Willys Jeep, 4 cylinder, water cooled engine, push button start. Instrument panel with engine and generator instruments, circuit breaker, controls, etc. Uses 8 volt car battery. (Battery not incl.) Skid mounted. Ship. wt. 1500 lbs.
 F.O.B. Chicago. **1295.00**
 Write for free information on other generators—350 watts to 25 KVA



HEAVY DUTY HYDRAULIC EQUIPMENT

Large supply of new labor-saving, economical hydraulic equipment in many types and sizes. Use these positive, highly efficient smooth pressure hydraulics on presses, arborers, lifts, loaders, power control, positioning, brakes, plastic dies, auto frame alignment, etc., etc.

ITEM #126—Four-way, open center control valve with built in adjustable relief valve. Factory set at 1000 P.S.I., spring loaded neutral position, for use with one double acting cylinder. In neutral position cylinder is locked and pump unloaded. Fully balanced plunger type, smooth, positive, easy operation, can be used as single unit or mounted in series of any combinations desired. Has 3/4" pipe thread inlet and outlet, 1/2" pipe thread cylinder ports. Newly manufactured to our specifications. Shipping weight 8 1/4 lbs.
 An outstanding Buy! F.O.B. Chicago. **21.50**

ITEM #160—PESCO GEAR TYPE HYDRAULIC PUMP—Compact—Powerful—Reliable. Especially designed for belt drive from fan belt, power take-off, drive pulley, electric motor or small gas engine. Equally suitable for direct coupling. Pedestal type mounting with two bolt holes for 3/4" hold-down bolts. Standard 1/2" pipe thread inlet and outlet ports. Delivers 4.5 GPM at 1000 PSI at 2800 RPM with 3 HP. Will actuate one Item #26, 3" bore, 24" stroke cylinder in 10 seconds. Hardened steel gears turn in dense oilite bronze bearings. Rotation—clockwise facing shaft. Guaranteed trouble-free service.
 Shpg. wt. 6 lbs. F.O.B. Chicago. **22.50**

ITEM #127—Double acting hydraulic cylinder. 1 1/2" bore, 1" stroke, 1/2" diam. shaft, 3/8" tubing thread ports. Over-all length closed—6 1/2". Clevis mounting at both ends. Perfect for clamping and feeding. **Postpaid.**
 F.O.B. Chicago. **5.95**

ITEM #166—Double acting hydraulic cylinder. 1 1/2" bore, 28" stroke. Will lift 1760 lbs. with 1000 PSI line pressure. Weight 8 lbs. A \$55.00 value. Now only. **Postpaid.**
 F.O.B. Chicago. **16.95**

ITEM #42—Double action hydraulic cylinder. 4" bore, 18" stroke. Rated lift capacity with 1000 PSI line pressure is 12,500 lbs. Shpg. wt. 30 lbs.
 F.O.B. Chicago. An Excellent Buy for. **32.50**

ITEM #29KJ—Gear Type Hydraulic Pump. Ideal for industrial applications and for operating all hydraulically powered farm implements including loaders, stackers, swathers, plows, etc. Delivers 1000 PSI (may be set at lower PSI if desired), 12 GPM at 400 RPM. Maximum operating speed 800 RPM — rotation counter clockwise. Has built-in relief valve, permanent or torque bar mounting, 1" diameter shaft, 3/4" pipe tap inlet, 1/2" pipe tap outlet. Shpg. wt. 22 lbs.
 F.O.B. Chicago. **45.50**

ITEM #103—Double acting hydraulic cylinder. 2 1/2" bore, 17" stroke. Clevis mounting. Will lift 4900 lbs. with 1000 PSI line pressure. 1 1/2" diam. shaft, 3/8" tubing thread ports. Overall length closed 28". Shpg. wt. 11 lbs.
 F.O.B. Chicago. **21.50**

ITEM #6—Double action hydraulic cylinder. 3" bore, 24" stroke, will lift 7070 lbs. with 1000 PSI line pressure. Steel barrel, 1 1/4" stainless steel shaft. Gov't. acq. cost \$176.00. Shpg. wt. 20 lbs.
 F.O.B. Chicago. **28.00**



BRAND NEW • GENERAL MOTORS — ALLISON
CENTRIFUGAL PUMP
TYPICAL PERFORMANCE DATA

Suction Lift	Head Pressure	Gal. Per Min.	H.P.	R.P.M.
10"	75"	260	5.0	3500
10"	65"	280	5.2	3500
10"	40"	40	1.5	2500
10"	50"	140	5.0	3500
10"	30"	100	3.0	2500

For Draining Basements • Fire-Fighting • Irrigation • Fuel Transfer • Swimming Pools • Home Water Systems • Dewatering
 This General Motors-Allison Centrifugal Pump—designed for use on U.S. Air Force Mustang Fighters, now converted for commercial, home, and industrial high volume pumping applications. Inlet, 2 1/2" standard pipe thread, twin outlets with 1 1/2" pipe thread, ball bearing supported 3/4" shaft. Easy, fast simple disassembling, rotation, counterclockwise facing shaft. Shipping wt. 35 lbs. Gov't acq. cost \$145.00. F.O.B. Chicago **NOW ONLY. 39.50**

NEW MODEL 353 — DUAL RANGE D. C. ARC WELDER

For Stationary or Portable Use. **HEAVY DUTY RANGE TO 250 AMPS. NEW 'MAGIC TERMINAL' FOR LOW CURRENT 30 TO 100 AMPS. IDEAL FOR A FARM • FACTORY • GARAGE • WORKSHOP**

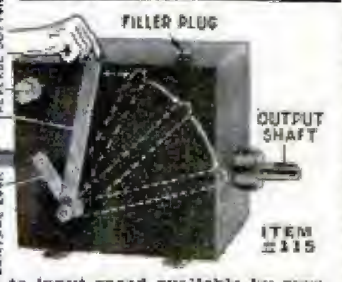
These precision engineered D.C. Arc Welders contain the highest quality War Surplus aircraft components built to exacting government specifications. They are light in weight, have oversized lifetime grease-sealed ball bearings, air cooled commutator, dial type rheostat for easy fingertip control, a high low rheostat switch, reactor coil for even arc and the new 'MAGIC TERMINAL' low current welding range for welding lighter materials. Designed for many years of trouble-free service. Run welder from drive pulley or power take off of a tractor or Jeep. 7 1/2 HP electric motor or 10 HP gas engine at 2500 R.P.M. Uses two V-belts or flat belt. Continuous output rating 200 amps. Inconsistent welding rating 350 amps. 30 volts. This sensational price includes double V or flat belt pulley and complete operating instruction. Shipping weight 107 lbs. \$350.00 Value. Item #88.
 F.O.B. Chicago Now only. **119.50**



HYDRAULIC SPEED REDUCER

WITH FINGERTIP CONTROL
USE FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Grain Separators • Garden Tractors • Pumps

Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Internal relief valves prevent overloading. Use input power of 1/2 to 1 1/2 H.P. This Westinghouse-Oil Gear Unit converted to commercial use from 40 MM anti-aircraft traversing mechanisms consists of a variable displacement hydraulic pump feeding a fixed displacement hydraulic motor. Adjustable relief valves set at factory for 100 inch pounds of torque may be reset up to 180 inch pounds. Independent reverse control allows full output power and speed selection in either direction of rotation. Both input and output shafts measure 3/4" diam., include keyways. Input rotation is counter-clockwise facing shaft. Recommended input speed not to exceed 750 R.P.M. Over-all dimensions: 7 1/2" x 7 1/2" x 1 1/2". Gov't acquisition cost, \$428.00. Shipping weight 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago. **54.50**



ORDER DIRECT FROM AD — SEND PAYMENT OR PURCHASE ORDER TODAY — SATISFACTION GUARANTEED

GROBAN SUPPLY CO. 1139 SO. WABASH AVE., CHICAGO 5, ILL. DEPT. PM-5

FREE: 1952 48-PAGE CATALOG
 Chuck-full of unsurpassed War Surplus Bargains for the farm, home, factory & workshop. You save on everything.
WRITE, WIRE or PHONE Webster 9-3793

How to Keep Fit at 50

(Continued from page 140)

3. A cool bath six days a week and a short, hot bath one day, all followed by vigorous towel rubs.

4. Golf or a long hike once a week.

5. Ultraviolet baths three times weekly.

6. Fewer fried and starchy foods and more fruits, vegetables and proteins.

That wasn't a rigorous schedule. Yet, in six months that man's over-all fat was reduced 28 percent, his abdominal fat 46 percent. His blood-pressure measurements improved 20 to 41 percent. There was only a two-percent drop in weight, indicating the flabbiness had been converted to solid tissue. His back became 10 percent stronger, his legs 7 percent stronger, and his chest expansion increased 4 percent. All this, remember, in a man nearing his sixtieth birthday.

Results like that show what a conscientious older man, working entirely by himself after our initial suggestions, can do to recondition himself. While his distance from death was probably lengthened, equally important is the fact that he'll likely live those remaining years more fully and in better health.

Here are the basic principles of a good fitness program, one that most men can adapt to their own circumstances without much difficulty. It requires neither elaborate conditioning equipment nor any particular athletic proficiency.

1. Exercise for the promotion of blood flow. The illustrations with this article comprise a well-rounded group of exercises, giving all parts of the body rhythmic exercise. In rhythmic actions like walking and swimming, the big muscles in your legs and back push the blood back toward the heart, make your heart stronger and serve to tone up the whole cardiovascular system. Inactivity causes large numbers of capillaries to close up. When rhythmic exercising gets your blood moving again, it causes new capillaries to open and your blood pressures (systolic and diastolic) will lower because the ejected blood encounters less resistance and circulates more freely.

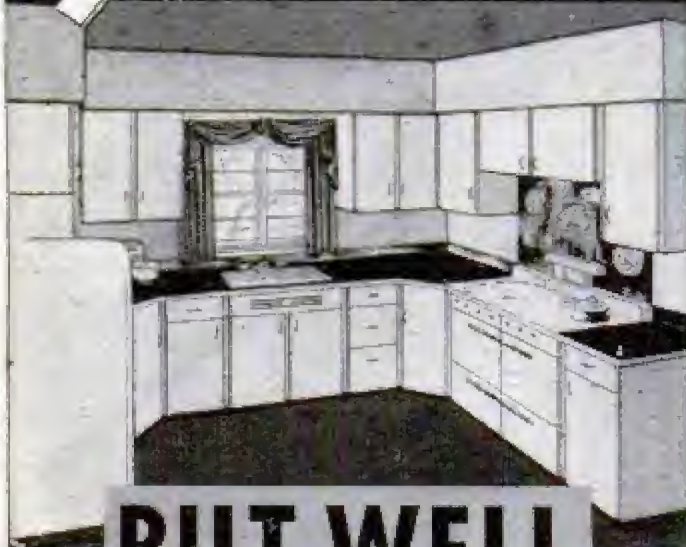
2. Get good doses of natural or artificial sunlight at least three times a week.

3. Bathe, shower and swim regularly in water at 72 degrees or cooler. Hot water brings blood to the skin surfaces, which can hold half of the supply, and draws it away from vital organs like the heart, pancreas and liver, where it is needed.

4. Walk at least two or three miles daily at a brisk pace and swim two or three times a week. These two activities rank among

(Continued to page 252)

It's easy
**to assemble your
own cabinets
for Kitchen or
Storage Walls**



**BILT-WELL
NU-STYLE CABINETS**

It's fun to build storage walls or equip your kitchen. It's simple with Bilt-Well wood cabinets. They are packaged pre-fitted cabinets ready to be assembled. A screw driver and hammer are the only tools needed. Instruction sheets in the carton show you how to assemble them.

Sold by leading Lumber Dealers

CARR, ADAMS & COLLIER CO.

Dubuque, Iowa



CARR, ADAMS & COLLIER CO., Dept. M
Dubuque, Iowa

Please send me BILT-WELL cabinet booklet. Enclosed 25c to cover cost of mailing.

Name

Address

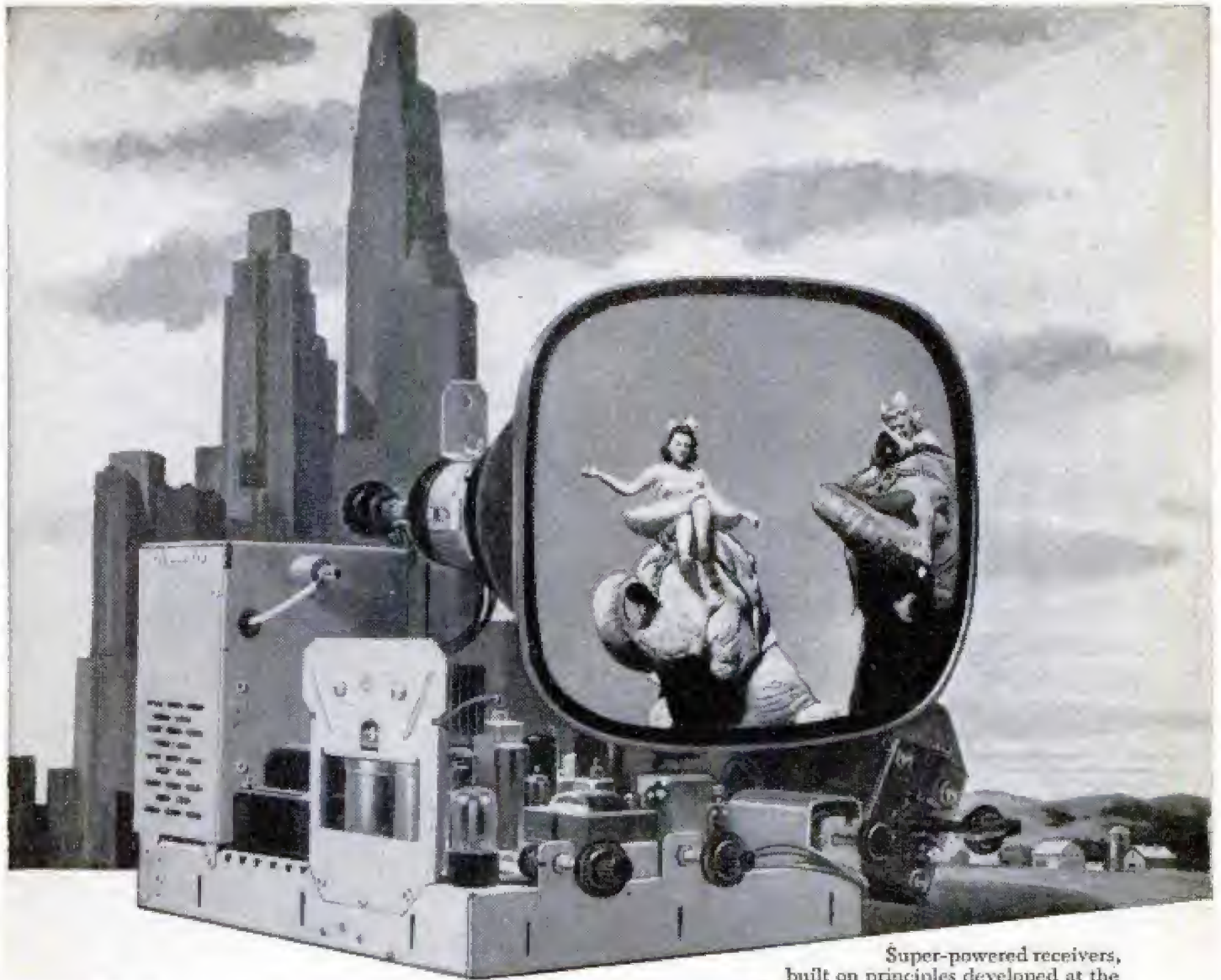
City

State

My Lumber Dealer is

City

State



*Super-powered receivers,
built on principles developed at the
David Sarnoff Research Center of RCA,
bring clearer television pictures to more homes.*

New Super Sets widen television's horizons!

Although no TV stations have been built since 1950, television's reach has been extended *in two ways*. In sections of cities where interference is a problem, fine pictures can now be seen. The same is true in rural areas, once too distant for clear reception.

RCA, to offset these limitations, developed powerful new Super Sets. In distant areas, these sets boost a weak signal into a clear, steady picture. In cities, where buildings and electrical devices may interfere, this super power—plus

television's first double-shielded tuner—brings in TV at its best. Result: stronger pictures in the country, steadier pictures in problem areas, and better pictures than ever in areas of normal reception.

Development of the new RCA Victor "Picture Power" Super Sets is another example of research and engineering at work for your benefit. This pioneering means fine quality and performance from all products and services of RCA and RCA Victor.

* * *

*See the latest in radio, television, and electronics at
RCA Exhibition Hall, 36 West 49th Street, N. Y.
Admission is free. Radio Corporation of America,
RCA Building, Radio City, New York 20, New York.*



RADIO CORPORATION OF AMERICA
World leader in radio—first in television



"While you're up there,
better get the 'DUCO' CEMENT!"

Fix it for keeps WITH DU PONT DUCO CEMENT



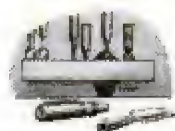
MEND POTTERY AND CHINA

so they'll be as useful
as ever, with
transparent "Duco"
Cement



STOP RUNS IN NYLONS

with a neat dab from
a handy, easy-to-use
tube of "Duco"
Cement.



WHEN HANDLES COME OFF

put 'em back on with
"Duco" Cement.
It's a must in the
toolroom.



DECORATE WITH DUCO. Put cutouts

on walls for a decal
effect. It's a neat job
with "Duco" Cement.

**STRONG, TRANSPARENT
FLEXIBLE, WATERPROOF**



BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

the very best conditioners. Other good rhythmic exercises are climbing, cycling, rowing, horseback riding, dancing, jogging, skiing, skating and paddling. Vary them so that you'll have a different one for each season of the year. Tennis is helpful as a means of staying in shape, but it can be too fast for the unfit. Group games like bowling, volleyball and golf are good for social mixing, but they have little value in physical conditioning.

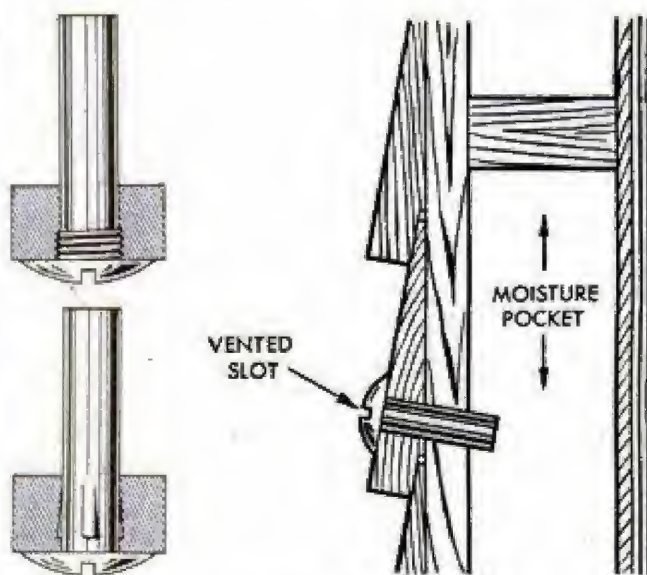
5. Eat green and yellow vegetables daily, and cut down on fat meats, light breads, eggs, coffee and fried foods. Stewed and fresh fruits, lean meats and broiled or baked fish are also healthful. Drink 6 to 10 glasses of water daily.

6. Don't overeat or overindulge in toxic poisons—alcohol or tobacco.

7. Sleep according to need, but be sure to get plenty after strenuous exercise. Most athletes sleep 8 to 10 hours, or more.

8. Maintain normal and emotionally stimulating activities.

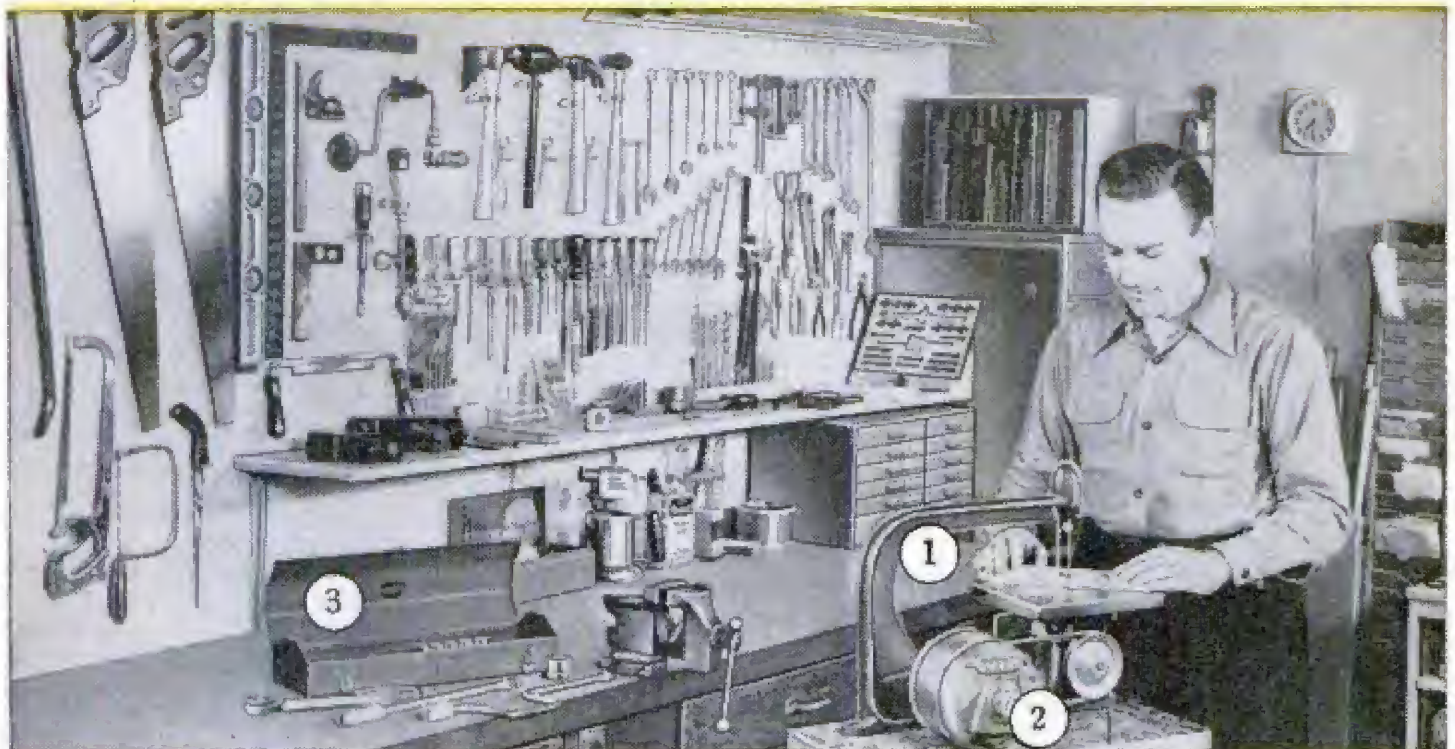
Nothing difficult or involved about that program, is there? But you are on the way to a longer and fuller life if you'll follow it faithfully.



Vent Tubes for Walls

Fabricated from strong, nonrusting alloy, small vent tubes for walls are quickly installed to prevent the lifting, peeling and blistering of paint on siding of frame homes. The vents are designed to relieve pressure, circulate air, release pocketed moisture and reduce condensation on inner walls. One type is installed in a drilled hole by tapping the vent with a hammer; the other has a portion of the tube threaded and is locked in place by screwing it into position. Both models are two inches long and have slotted, domed caps that shed water.

You Don't Have To Be A Tool Expert To See Why Experts Choose Guaranteed Westcraft Tools!



Just one visit to Western Auto will prove to you that famous, professional-quality Westcraft Tools give you the same lasting accuracy of other brands costing far more. Every West-

craft Tool is precision-built, fully-guaranteed . . . the kind of tool you'll be proud to own. And they're yours on easy Western Auto terms. See, try and compare Westcraft this week!

① **Tilt Table Jig Saw** does accurate jig, scroll, sabre sawing in wood and plastics to 1" thick. Scotch yoke, oilite bearings. 5" blade, adjustable guides. . . . (2H1102) **\$19³⁵**

② **1/4 HP Electric Motor**, 1725 rpm, 115 volt, 60 cycle AC. Split phase. GE guaranteed for 1 year. Use with jig saw, washer, churn, paint sprayer, etc. . . . (2H1600) **\$16⁹⁵**

③ **Westcraft 17-pc. Socket Set**. 1/2" sq. drive, alloy steel, chrome-plated. Twelve 12-pt. sockets, 7/8" to 1". 36-tooth rev. ratchet, 4 fittings. . . . (HR2961) **\$19⁴⁵**



Soldering Iron, 100 watt. Many home uses. Fast-heating nickel chrome sealed-in element lasts longer. 6-ft. heavy duty cord. Only. (4HR4816) **\$2⁰⁰**



"Loc-Grip" Plier. 1500-lb. grip. Use with ratchet action or as lock-on handle. Narrow steel jaws, hardened and tempered. Only (HR1296) **\$1⁹⁸**



Screwdriver, alloy steel, chrome-plated. 4" sq. blade. Extra long, positive-grip handle. Professional quality. Yours for (HR1381) **85¢**



1/2" Electric Drill, 115 volt. Alloy steel gears for greater power. Cutler-Hammer trigger switch. Polished aluminum alloy housing. . . . (2H1380) **\$33⁹⁵**

Professional Quality—Wizards of Performance

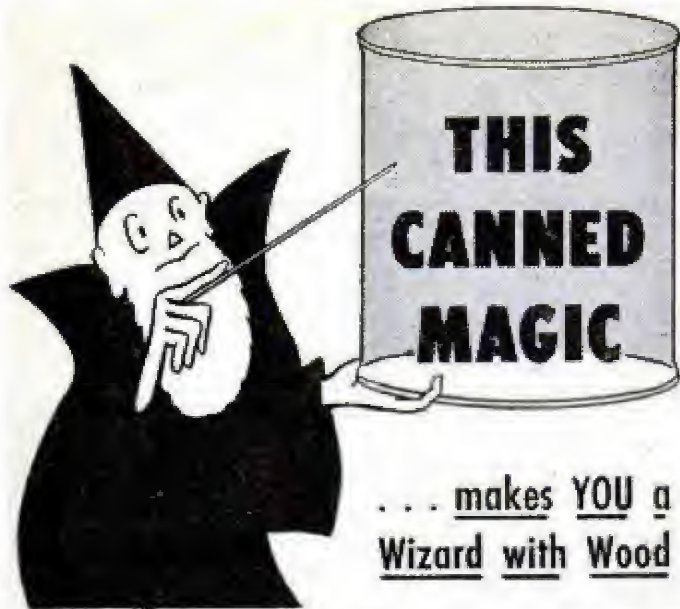
WESTCRAFT TOOLS

WESTERN AUTO
STORES & ASSOCIATE STORES

Sold
Only By

Sold by the largest group of associated tool departments in America

NOTE: Western Auto Associate dealers own their own stores and set their own prices, terms and conditions. Prices may vary due to differences in local conditions. If you do not know the location of your nearest Western Auto Store, write Western Auto Supply Co., 2107 Grand, Kansas City, Missouri © 1952 (PM52)



... makes YOU a
Wizard with Wood

Handy with your hands? Is making things your hobby? Like to do odd jobs? You'll bless the day you discovered the magical results you can obtain with Weldwood Glue, Firzite and Satinlac. At hardware, paint and lumber dealers. Mail coupon for free leaflets.

Gets that blond or pickled effect—



Produces those magical "woody" effects—on hard wood or soft, plywood or solid lumber. For light pastel tones, tint White Firzite with Colors-in-Oil. (On fir plywood stain jobs, tame that wild grain with Clear Firzite.)

WHITE FIRZITE*

Gets that Natural-Wood Finish



—without shellac or varnish. On furniture, panelling or woodwork, there's nothing like Satinlac. Brings out natural grain and color beauty of any plywood or solid wood. Avoids that "built-up look; will not turn yellow or darken with age. "Water-clear," easy to brush or spray, dries ready for next coat in 2 or 3 hours.

SATINLAC*

The Wood Glue you can rely on!



To make things or fix things, use Weldwood Glue for all wood-to-wood bonds. Makes joints stronger than the wood itself. Mixes easily with water. Stain-free, rot-proof...highly water-resistant!

WELDWOOD®
PLASTIC RESIN GLUE

Pints, Quarts,
Gallons

*Trade Marks

United States Plywood Corporation,
Dept. 52, 55 West 44th St., New York 36, N.Y.

Send me free leaflets on Weldwood Glue, Firzite
and Satinlac.

NAME _____

ADDRESS _____



One enemy soldier deserves an A for effort—he hit the leading edge of a jet's wing with this rock

Tall Tales From Korean Skies

(Continued from page 109)

Machine-gun bullets failed to set them afire, so they dropped a 500-pound bomb. The ice broke and the trucks sank out of sight.

Flying over the enemy lines in Korea, an Air Force B-26 light bomber took a direct hit from an anti-aircraft shell. The explosion blew the pilot, Lt. John H. Blake, right through the plastic nose of the plane but did not kill him. He parachuted down and dodged Communists for 30 days before being rescued by a Third Air Rescue Squadron Albatross.

Nobody in Korea ever thought of a carrier airplane's tail hook as a weapon. But Capt. George E. Mouzakis, Marine Corsair pilot, lowered his hook while flying low over enemy territory and ripped out a few enemy telephone lines with it.

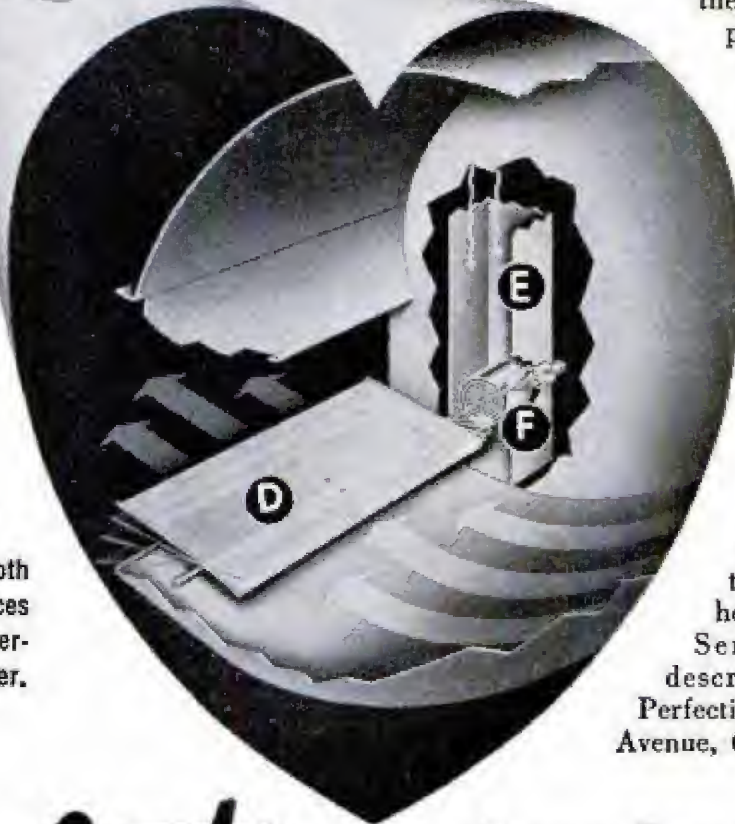
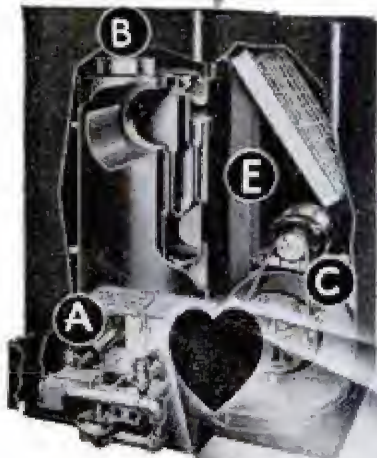
It is amazing how an airplane can fly with a large chunk of wing or tail shot off. Marine Corsair pilot Lt. Robert H. Wilson got his fighter back to friendly territory minus four feet of one wing, knocked off in a mid-air collision. Then there was Ensign Neil Armstrong, Panther jet pilot, who lost three feet of his wing when he hit a telephone pole while strafing trucks near Wonsan. He nursed the plane back to 14,000 feet and headed for friendly territory before bailing out.

Sometimes a crash landing is made in combat and the pilot walks away from it. Ensign R. R. Sanders was flying over Korea

(Continued to page 256)

How the greatest furnace invention in 29 years gives far greater heating comfort!

*Perfection Regulaire**, the greatest advance in warm air heating in 29 years, regulates the amount of air flow in exact proportion to the furnace output. It provides a wonderful new measure of warm air comfort never before possible. Secret of Regulaire* performance is a heat-sensitive coil which expands and contracts at different temperatures. The coil moves the vane which opens and closes a portion of the blower outlet—automatically providing the equivalent of a 1000-speed blower!



How Regulaire* Works—After thermostat is set at desired room temperature, burner (A) comes on at Coasting Fire, then turns to High Fire if the rooms are cold. When the furnace bonnet (B) becomes warm, the Regulaire* Blower (C) begins quiet delivery of warmth with vane (D) closed. Warm air is drawn down duct (E) and warms thermacoil (F) which gradually opens vane (D) to gently increase flow of warm air to your rooms. It is this thermacoil and vane—sensitive to the slightest change in bonnet temperature—plus a 3-stage burner, that regulates the flow of warmth to your rooms, and assures perfect heating comfort in any weather. Send for free descriptive folder describing Regulaire* in detail. The Perfection Stove Company, 7364-A Platt Avenue, Cleveland 4, Ohio.

*Regulaire**

Available now in both gas and oil-fired furnaces —See your nearest Perfection furnace dealer.

Perfection

Superfex Furnaces with
*Regulaire**



* PATENTS PENDING

**Extra Power...
Extra Speed...
EXTRA HANDY FOR
HOME JOBS!**



BLACK & DECKER
Utility
5" Sander-Polisher
only \$32.95
(including useful
accessories.)

**It drills, sands, polishes, grinds,
sharpens, buffs, burnishes, cleans!**

THIS Black & Decker Tool has extra power to handle heavier-duty drilling in wood, metal, masonry and plastics . . . a 3000 R. P. M. spindle speed that pays off in faster, smoother sanding . . . and unmatched versatility for driving a whole raft of other attachments! Comes complete with $\frac{1}{4}$ " Jacobs drill chuck, sanding discs, lambswool bonnet, auto polish and wax. Compact, perfectly balanced, weighs only 3 $\frac{1}{2}$ lbs., operates on AC or DC, quality-built for years of service.

Try it yourself today at your hardware, appliance or department store. Write for free catalog to: THE BLACK & DECKER MFG. CO., Dent. H5M, Towson 4, Md.

B&D SANDER-POLISHER KIT (\$49.95)

Has everything for home jobs—in a handy steel carrying case you can take to the job! Accessories listed above, plus 7 high-speed bits, 4 wood augers, countersink!



Black & Decker

UTILITY
ELECTRIC
TOOLS

**PORTABLE
ELECTRIC
TOOLS**

$\frac{1}{4}$ "- $\frac{1}{2}$ " DRILLS • SANDER-POLISHERS • SAWS

when his engine quit. Below were rice paddies, definitely taboo for forced landings, so he decided to try to land on a dirt road. Suddenly trees loomed up ahead. One wing hit a foot-thick tree and was sheared right off. The plane hit the road, skidded 100 feet on its belly and stopped. As Sanders walked off, he could hear the radio still blaring in the cockpit.

If you think that tale demonstrates how tough a modern plane is, listen to this hair-raising tale of an F9F pilot who was trying to land his plane aboard the famous carrier Essex. On his first attempt, he came down too hard. The plane bounced back into the air, still flying. The landing hook in its tail caught a length of nylon tape from the top of the arresting barriers. Farther up the deck, the Panther crashed into another jet waiting to take off. The impact knocked off the parked plane's canopy, narrowly missing the pilot's head, and sheared off a wheel from the errant Panther.

Continuing over the carrier's bow, the plane barely missed hitting the water. The nylon tape, tangled in the landing hook, dragged in the water and the jet exhaust threw up spray as the plane staggered back into the air for a second try at landing. Meanwhile, the deck was cleared of all planes and a line of tractors was placed behind the barriers to stop any second "miss" of the arresting cables.

The pilot came in fast again, this time bringing the plane down on its one wheel. Because the arresting hook was fouled with the nylon cable, it failed to catch any wires. Panicky, the pilot applied full power. The plane sheared off the rest of its landing gear on the tractors, skidded 300 feet up the deck on its slick belly and knocked off its flaps and tip tanks. Still going full blast, the plane again flew off the bow of the carrier and into the air.

Picking up his microphone, the pilot advised the ship in a masterpiece of understatement, "This is becoming a rather rugged flight!" With no wheels or flaps, he decided to fly to shore and try a belly landing. Twenty miles from the beach, he ran out of fuel and had to ditch the plane in the ocean. The pilot turned in his Naval aviator's wings after that episode.

Chemical Kills Algae in Lakes

Better swimming in small lakes is forecast through use of a chemical which kills blue-green algae. These algae are responsible for heavy summer growth in lakes. Extremely small doses of the chemical, developed by University of Wisconsin botanists, will kill the undesired algae without disturbing fish or other plant growth.

Install an AUTHORIZED Reconditioned Ford Engine..

for about half the price of a new one!



**Owners report 50,000 miles or more
added to the life of their faithful Ford!**



**Over 150 new Genuine
Ford Parts or Reconditioned Parts
in every rebuilt engine!**

New genuine Ford Controlled Expansion pistons, *new rings, new pins, new main and rod bearings, new valves, new timing gear, new valve springs* . . . all help to give you new-engine power and economy with an Authorized Reconditioned Ford engine.

Also major reconditioning operations in Ford-inspected Plants assure you of high-quality performance in every engine. Up to 50,000 extra miles of day-in, day-out service for about half the price of a new engine is a bargain you shouldn't miss. See your Ford Dealer today—one-day installation by appointment.

*Supplied by Ford Authorized Reconditioners
through Ford Dealers*

*Look for this
Authorized emblem...*

on the engine and parts you buy. It's backed by the Authorized Reconditioner's Warranty. Any defect in material or workmanship appearing in 90 days or 4,000 miles . . . whichever occurs first . . . will be remedied at no extra charge by the dealer from whom it was purchased.



**Save money, too, with these
AUTHORIZED Reconditioned
Ford Parts**

. . . carburetors, clutch discs,
voltage regulators, fuel pumps,
distributors, generators,
starting motors, brake shoes.

Can't beat it - for EXPERT SANDING



MODEL 106

Only \$49.50

PORTER-CABLE
Guild

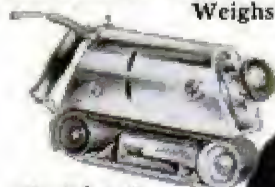
**POWERFUL
Motor-Driven
SANDER**

NOW - give your woodworking projects a *fine piano finish*... 10 times faster than hand sanding!

Abrasive pad travels at high speed in 1/4" orbits. Grits move in overlapping circles—with, against, and across the grain. No tracking - no gouging - no burning. Makes a smooth, even, uniform surface every time!

MOTOR DRIVEN—NOT A VIBRATOR

Not a vibrator. Husky AC-DC motor - 4000 RPM under load. Gearless drive - needs no lubrication. Dust-free air intake. A professional type tool throughout. Patented paper clamp holds 1/3 of standard 9" x 11" sheet tight. Weighs only 6 lbs.



**Model A-2
Guild Belt Sander**

Popular with builders. Use it for heavy duty stock removal; sanding large areas; taking off paint; grinding metal, stone, composition. Belt, 2" x 21". Speed, 600 SFPM. Weight, 9 lbs. Only \$62.50.

See Guild Sanders at your dealer... or mail coupon today.

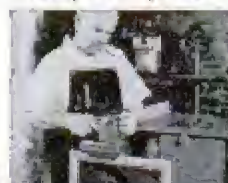
Can't beat it—
for
**HEAVY
SANDING**



Leaves no fur—
provides smooth,
flat surfaces



Levels glued,
butt, miter joints



Chamfers edges—
fits frames



Sands large areas
at high speed

Your Home — 1902 to 1952

(Continued from page 102)

for heating more economically than with electrical-resistance heating. The heat pump operates as a reverse-cycle refrigerator to extract heat from the surrounding air, ground or water.

It is popular today to say that housing is a handicraft industry—and this statement is largely true. Mechanization has affected this industry less than many others and this accounts partially for increasing costs. Many of the products that go into the house, however, are produced by highly mechanized means and the techniques of industrial production are being applied to the construction of the house itself. Nevertheless, the fact remains that the basic tool of house construction is the hammer, not the power-driven automatic nailing machine.

Studies conducted by the University of Illinois Small Homes Council in 1947 show that construction time can be saved even on one house by the use of improved construction methods. These included precutting, tip-up wall framing and clear-span roof construction with the use of wood trusses. Working with a carefully prepared cutting schedule, the builder can make maximum use of standard lumber sizes. Cutting may be done with power equipment at one time. In the use of tip-up construction, the carpenter has the advantage of working on the flat surface of the previously completed floor. Walls may be sheathed before being tipped in place. Roof trusses may be built on the floor and then erected with a minimum of labor. This makes possible the quick enclosure of the basic outline of the house and the formation of a large open room. When dry-wall construction is used, the contractor installs both ceiling and side-wall finish at this time, before the erection of interior partitions. This is a saving, as it eliminates much cutting and fitting around walls.

Large operative builders carry these operations to a greater degree of productivity. Precutting may be done at a central plant or at the site itself. Subassemblies of walls and roof sections may be made similarly. Specialized crews work on limited jobs with maximum efficiency. This is essentially a prefabricated operation.

Production-line methods are seen at their greatest development in the factory-built house—a product from a central plant which is shipped to many builders. Here the construction of major parts of the house may be followed down a series of assembly lines. Final assembly, of course, must await delivery of the house to a site. The housing

(Continued to page 260)

PORTER-CABLE MACHINE CO.
6165 N. Salina St., Syracuse 8, N. Y.

Please send complete information on
() Guild Orbital Sander () Guild Belt Sander

Name.....

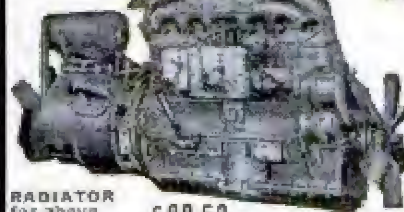
Address.....

City..... State.....

Manufacturers of **SPEEDMATIC** and **GUILD**
Electric Tools

In Canada, write: Strongridge, Ltd., London, Ont.

65 KW. 225 Volt D. C. DIESEL ELECTRIC GENERATING UNIT



RECONDITIONED

Equipped with 6-cyl. DRXC Hercules DIESEL engine, 4 1/2" bore, 5 1/4" stroke, 133 H.P. at 2000 R.P.M. Complete with injector, pump, nozzles and electrical equipment. Generator attached to engine. Complete as shown.

RADIATOR for above unit \$89.50

Each \$1375.00
Lots of 2 each **\$1295.00**

Write for price on DIESEL ENGINE only.



1952 EDITION

It's NEW! Get the world's largest Auto Accessory & Parts Catalog & Save money. Over 50,000 items, including Hollywood Accessories, Hi-Speed Equipment, Rebuilt Engines, all parts & accessories for all cars & trucks. We have that Hard-to-Get part. Completely Illustrated. 100 pages, Send 25c refundable.



FOR GAS, OIL, WATER. NEW 5 GAL. CANS

- Self locking cap.
 - Compact in size.
 - Sturdily made.
 - Floats when full.
 - 3 bar strong handle.
 - 18" High, 14 1/2" thick, 13" wide.
- Ea. \$2.95 \$2.49
Lots 5, or more ea.

SEND 25% CASH WITH ORDER, BALANCE C.O.D.

J. C. WHITNEY & CO.

1917SP ARCHER AVE. CHICAGO 16, ILL.



GRAVELY makes tough jobs EASY!

Powerful!

5-HP Gravely Tractor powers 20 tools—does every lawn, garden, and field job easier, better! All-gear drive, Reverse. New "Power vs Drudgery" Book. Let FREE. Write for it today!



GRAVELY

BOX 563 DUNBAR, W. VA.

FIELD-TESTED FOR 31 YEARS

U. S. Patents
No. 2,351,906
No. 2,461,872

Save Fingers



Steel-Grip Finger Guards Lower Your Hand Protection Cost
Hundreds of factories save time and injuries by protecting workers with Steel-Grip Open End Finger Guards. For handling rough, sharp articles, buffing, grinding, sanding, punch press work, and hundreds of other jobs. Protect fingers or thumbs, front or back, from cuts, abrasions or blisters. Various designs in leathers and other materials; elastic web back for snug, cool, comfortable fit. Sizes for men and women. Send 10¢ for sample. Catalog of Safety Apparel Free.

Steel Grip INDUSTRIAL Safety Apparel

INDUSTRIAL GLOVES COMPANY
A Corporation
1400 Garfield St., Danville, Ill.
(In Canada, Safety Supply Co., Toronto)

To Be Sure of the Genuine Demand This Trade Mark

FAMOUS INDUSTRIAL SAFEGUARDS SINCE 1910

POWER plus ACCURACY



Use a Plumb — after your first few strokes you'll know it's engineered to strike with power and precision.

You'll feel the perfect balance—weight is centered behind the driving face, adds extra force, lessens fatigue.

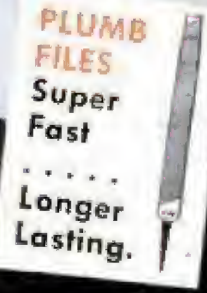
It has the features you want. Special analysis steel head, held secure by a safety wedge. Heavy chamfer on striking face prevents chipping. Cone shaped pein spreads rivets evenly, without mashing them. Non-slip handle, made from tested second growth hickory.

Use a Plumb. You'll do better jobs, faster.

The black head with the red handle—exclusively PLUMB

Quality Comes FIRST
PLUMB
is FIRST in Quality

PLUMB®



HAMMERS • HATCHETS • AXES • FILES

FREE

★
1952

ALLIED RADIO & TV CATALOG

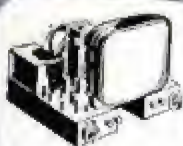
EVERYTHING IN RADIO
AND TV AT LOWEST PRICES!

SEND FOR IT

212 PAGES
Value-Packed

**Everything for
Experimenters, Builders, Amateurs,
Servicemen, Engineers, Soundmen...**

Save money on every Radio and TV need! Get the big 212-page 1952 ALLIED Catalog featuring the world's largest selections of top-quality electronic equipment at lowest, money-saving prices. See the latest in TV, home radios, Amateur equipment, P.A. systems and Hi-Fidelity custom sound, recorders, test instruments, builders' kits—plus thousands of parts, tools, books and diagrams. Get more for your money from the World's Largest Radio Supply House. Send today for your FREE 1952 ALLIED Catalog!



Save on
Everything
in Radio & TV



FREE
CATALOG

SEND FOR IT TODAY

ALLIED RADIO

ALLIED RADIO CORP., Dept. 5-EE-2
833 W. Jackson Blvd., Chicago 7, Ill.

Rush FREE 1952 ALLIED 212-Page Catalog

Name _____

Address _____

City _____ Zone _____ State _____

industry will always involve more on-site labor than other mass-produced items.

Factory-built housing is gaining. Prefabrication of this sort is primarily a development of the last 50 years, with the major expansion occurring after World War II. Last year the largest manufacturer of these homes produced over 10,000 units.

Many factory-produced prefabricated houses demonstrate the principle of stressed-skin construction, which has been studied at considerable length by the Forest Products Laboratory, Madison, Wis. In this system, there are savings in framing lumber, as the interior wallboard and the exterior sheathing of the wall are glued to the framing members for added strength. In this way, these skins form a part of the structure itself.

Building has been undergoing a major evolution in the past few years. After much study by interested groups, recommendations have been made for the reorganization of materials on the basis of a common-denominator dimension, or module, of four inches. Gradually, different material sizes are being changed so that they may be coordinated with each other. Modular coordination means saving in labor and materials. The basic idea is to join two materials without special cutting and fitting.

With most framing members spaced at 16 or 24 inches in the average house, and with most sheet materials manufactured in multiples of two or four feet, house design and construction can be coordinated on an even larger multiple module than the simple four-inch one. Although the design of houses on the basis of 16 inches or 24 inches appears logical, few house plans have been developed around this scheme.

In 1950 the Lumber Dealers Research Council gave a grant to the University of Illinois Small Homes Council to study planning on this basis. This study resulted in 28 plans which demonstrated the idea of planning with room units. The dimensioning and structure of these houses are based on the 16 or 24-inch module. A most important feature of the plans is the coordination of the window openings with the structural frame. No extra framing is required for windows, as they are framed by eliminating one stud where the window is to be placed.

Architects and builders are constantly searching for ways to improve the American house. Today we believe in planning the house inside out—we arrive at a convenient interior arrangement and allow it to be expressed on the exterior. We are not concerned with a "style" but with good design and honest use of materials.

(Continued to page 262)

Brown WALL BREATHERS

STOP

PAINT BLISTERING, PEELING



EASY TO INSTALL

3/4" Diameter—3 1/2" Long

— GIVE PAINT A CHANCE!

PROTECT YOUR HOME SAVE COSTLY REPAIRS



Between walls condensation causes paint to peel. Brown Wall Breathers permit moisture to evaporate, allow paint to adhere properly, regardless of climate.

Available at Paint & Hardware Dealers or Write for Full Information.

Brown INDUSTRIES

14222 LAKE SHORE BLVD. CLEVELAND 10, OHIO

PUT PIONEER SELF-RELEASING HOOK ON YOUR CHAIRLINE

SAVE A TRIP

EVERYTIME YOU SERVE A LINE

SATISFACTION GUARANTEED

PIONEER Mfg. Co. P.O. BOX 494 BAKERSFIELD CALIF.



Set To Strike



Released

Patent No. 2513256

Cut glass easily ask your dealer for **Red Devil** glass cutters



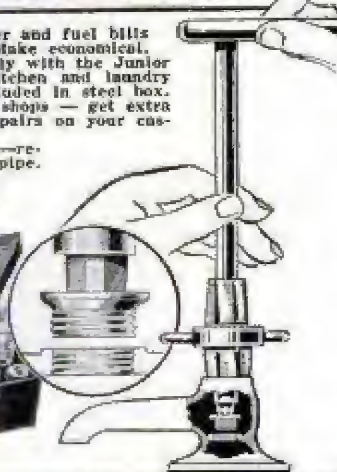
RED DEVIL TOOLS, IRVINGTON 11, N. J., U. S. A.

STOPS LEAKS PERMANENTLY

Cut your fixture replacement, water and fuel bills with Economy Renewable Seats. Make economical, permanent repairs quickly and easily with the Junior Kit (illus.). Repair bathroom, kitchen and laundry fixtures. Everything you need included in steel box. This is a natural for the "Fixit" shops — get extra income from making permanent repairs on your customers' faucets.

Senior Master Kit also available — repairs faucets and valves up to 1" pipe. Write for illustrated circular.

JUNIOR KIT, only \$22.50 with 15 assorted Renewable Seats. "Less than the cost of a set of Eitzen sink fixtures."



ECONOMY VALVE SEAT CO.

1430 N. Keating Ave. Chicago, Ill.

Clean hands

FAST!



but save your skin!

Boraxo "melt-away" action cleans hands faster, gentler than any other hand soap!

No harsh abrasives! Boraxo powdered hand soap contains tiny soluble crystals that clean paint, grease, stains, ground-in dirt, leaving hands and knuckles soft! A *must* for every man who has a workshop, or works on his car, in his garden, or around the house. Get hands *safely* clean in 30 seconds flat, with BORAXO! . . . for all the family!

SPECIAL OFFER

for home, workshop, garage, etc.



Boraxo Home Dispenser plus giant 16-oz. can Boraxo, both only

\$2.95

The Home Dispenser is white, refrigerator-type baked enamel on rugged 12-ga. steel! Holds many weeks' supply of Boraxo! One-piece plunger mechanism will not clog! Built to last . . . easy to install . . . this is a real bargain you'll be glad to own and use for years to come!

MAIL THIS COUPON TODAY!

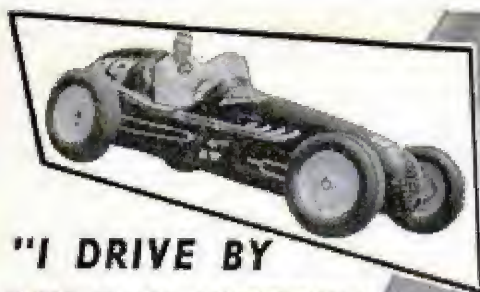
Pacific Coast Borax Co.
Dept. P-5
100 Park Ave.
New York 17, N. Y.

Please send me *postpaid* the Boraxo Home Dispenser and giant 16-oz. can Boraxo. I enclose \$2.95 (in check or money order). If not entirely satisfied I may return them for prompt refund. Offer good in U. S. only.

Name.....

Address.....

City.....Zone.....State.....



"I DRIVE BY MILE-O-METER"

says *Reg. U.S. Pat. Off.*

LEE WALLARD

winner of the 1951
Indianapolis 500-Mile
Speedway



**GUARANTEED FOR
100,000 MILES**

"The Mile-O-Meter is great! It's one of the most important instruments that you can install in your car. It's the only gauge on your dashboard that can tell you how your engine is performing, and whether or not you're getting maximum mileage out of every gallon. I endorse and recommend the Mile-O-Meter to every motorist."

Lee Wallard

Install Mile-O-Meter on the dashboard of your car in a few minutes . . . no holes to drill, no experience needed. Mile-O-Meter will faithfully register miles per gallon at every speed and driving condition. You actually save gallons of gas because Mile-O-Meter accurately and continuously indicates the rate of fuel consumption. Mile-O-Meter also serves as a constant check on motor conditions, and warns you when adjustments are needed. Mile-O-Meter is the only instrument on your dashboard that can give you all this information. It's the most important investment you can make for overall driving economy and safety . . . pays for itself over and over again.

CHECKS PERFORMANCE



CHECKS CARBURETOR



CHECKS TIMING



CHECKS RINGS



CHECKS DISTRIBUTOR



FREE with your order:
24 Page Motorist's Manual,
Instruction booklet,
and handy Mileage
Calculator.

MAIL YOUR ORDER TODAY!

Dealer Inquiries Invited

money-back
guarantee.

\$14⁹⁵

Deluxe
Illuminated
Model
3 1/2" dia.
Fed. Fed.
Tax incl.

\$9⁷⁵

Standard
Model
2 1/2" dia.
Fed. Fed.
Tax incl.

Order from **GALE HALL ENGINEERING** Dept. 162
107 Northampton St., Boston 18, Mass.

Please send.... Deluxe Standard Mile-O-Meters at \$

Name

Address

City

Check enclosed C.O.D. Gift Wrapped (free)

Our new house is striving to be consistent with our way of life. It is a suburban house on a larger plot of land. This new space and our new heating systems have made it possible to have a sprawling home on one floor—and this is the desire of the majority of homeowners. Because of some inherent drawbacks and its cost, the basement is disappearing in many of our homes. Forced-circulation warm-air and hot-water heating have made this possible. The split-level or trilevel house, with its utility level only partially below grade, offers an excellent compromise between the basement-less and the basement house.

We are turning our houses around. The alley is gone—our back yard is now our private garden. The living rooms of the house face this garden. We put the garage and the services on the street side.

To combat the problem of reduced space, we are using more open plans, more double-purpose rooms and more glass, which serves to give a visual extension to the living space as well as greater quantities of light and sunshine.

Architects are looking forward to many improvements in the future house. Although the mechanization of the house seems complete, it is certain that new devices will be developed for household consumption. The possibility of larger packages for site assembly is intriguing. Why not an entire bathroom rather than three fixtures? The central utility core is so basically sound that its eventual use is almost certain, although its first introduction met with failure. The trailer-size package which unfolds into a house (as demonstrated by the Acorn prefabricated house) seems destined to make an impression in the prefabricated field. Perhaps someone will solve the problems of panel construction and we may be able to purchase several standard wall sections at the nearest lumberyard when we want to add a room or build a house.

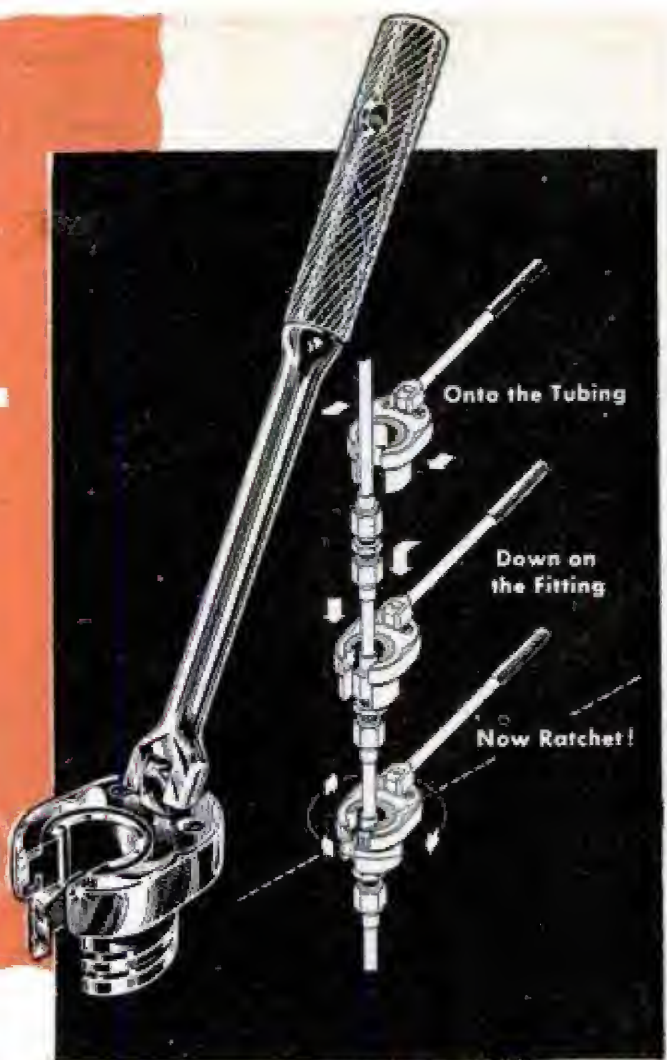
As our natural resources are expended, we must expect to see an increased interest in the sun as a source of energy. Solar energy will be used to heat more homes—we have the know-how now.

I expect to see the principle of the "open room" construction extended even further. I predict that the day will come when the average house will be a large open shell. It will be equipped with a package utility core and kitchen having permanent positions. All other partitions will be readily movable storage units. With this flexibility, we could remake our house to suit the needs of the moment and the building industry will have made its newest and greatest contribution to American living.

Only **TAC** has perfected the
**open-end
 ratchet wrench...**

This TAC Open End Ratchet Wrench is doing spectacular jobs in the Armed Forces and Defense Industries. Made in Socket Type and Crowfoot type.

Sizes 3/8" to 4". Will operate with as little as 7° ratcheting arc on fittings, tubing, pipe, rod, cable, etc. Fully protected by patent
TAC does what no other tool can do.



TUBING APPLIANCE CO.
 10321 ANZA AVENUE
 Los Angeles 45, California

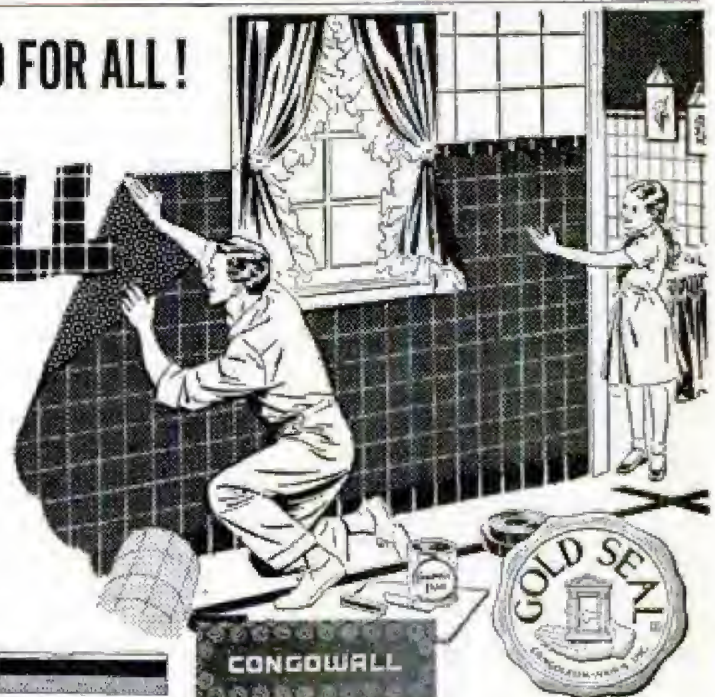


© 1951—TAC

MODERNIZE YOUR WALLS... ONCE AND FOR ALL!

CONGOWALL
 TRADE-MARK ®

LOOKS... }
 FEELS... } like never needs
 CLEANS.. } TILE refinishing!



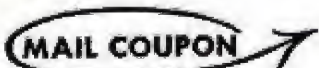
Put up Gold Seal Congowall—and your work's done for good! No refinishing, no repairing, no repainting... ever!

And there's nothing to it. Because, tough, sturdy and durable as it is... Congowall is *really* flexible and easy to handle. A *cinch* to install! Just paste it up, that's all. Congowall locks itself to your wall... and stays there! It's up successfully in 3,000,000 homes!

Congowall's baked enamel surface looks and feels like expensive ceramic tile... even to the mortar lines. And like tile, it cleans quickly with a damp cloth... stays bright and beautiful for years.

Cost? Only about 15¢ a square foot!

See the wide range of colors at your Congowall dealer's. Or



Duplex backing absorbs paste... locks Congowall to wall!

Patented duplex backing identifies genuine Gold Seal Congowall.

The Gold Seal guarantees satisfaction or your money back!

Congoleum-Nairn Inc., Kearny 7, New Jersey
 Please send me the free Congowall color guide and instruction folder.
 Name
 Address
 City..... Zone..... State.....

© 1952, Congoleum-Nairn Inc.

**FIND OUT HOW YOU CAN SAVE MONEY
WITH HASTINGS Aero-Type Shrouded!**

● Here's the spark plug that's saving big money for owners of cars, trucks and tractors. Hastings gives much longer life—better performance, too—because both electrodes are shrouded from the hot flame sweep. There's less fouling, less electrode erosion with Hastings. And they are easier to clean.

If your dealer cannot supply you, send order giving make and model.

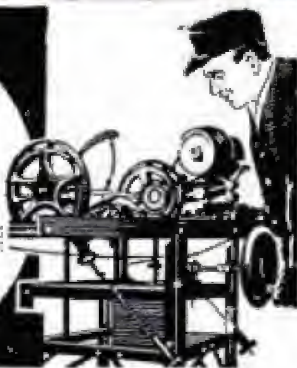


**\$100
EACH**

For complete information write for illustrated folder, Dept. PM Hastings Mfg. Co., Hastings, Mich.

HASTINGS Aero-type Shrouded SPARK PLUGS

Spare Time
**\$3.00 AN
PAYS 3 HOUR**
*and MORE
with*



UNIVERSAL Lawn Mower Grinder

Here is a business you can start in your own garage or basement. Sharpen hand and power mowers on the Universal Grinder and make \$3.00 to \$5.00 an hour.

G. Sparlock of Arkansas writes: "I have had my Universal Grinder only 2 months. Live 2½ miles from town. Yet have already made \$227 net profit." J. L. Peterman of Pa. says: "I averaged \$100.00 a week in May, and made \$1,000.00 spare time this season."

REMEMBER—Only on the UNIVERSAL GRINDER can the inside face and edge of the stationary blade, as well as all of the reel blades, be ground to the proper clearance

ALL IN ONE SET-UP

**WITHOUT REMOVING ANY BLADE FROM THE MOWER
Rogers Mfg. Co., Dept. M-52, Lindsey, Ohio**

SEND THIS COUPON NOW

ROGERS MFG. CO., Dept. M-52, Lindsey, Ohio
Please send me full facts about the Universal Lawn Mower Grinder and its big money making opportunities.

NAME _____
ADDRESS _____
CITY _____ STATE _____

**The Owners Report on the
1952 Pontiac**

(Continued from page 94)

is locked and the control knob is inside the car, which is good as it discourages theft of under-hood units.

The panel which houses the instruments is rather small but practical. I was impressed by the very large and easy-to-read numerals on the mileage indicator. Two duct-type ventilators are easily operated by separate knobs on the dash. The heater

ACCELERATION TESTS

**Pontiac Chieftain "8" 4-Door Sedan
With Dual-Range Hydra-Matic Drive**

¼ mile from zero.....	20.35 seconds—High drive range
	19.10 seconds— Low drive range
½ mile from zero.....	33.10 seconds—High drive range
	31.90 seconds— Low drive range
0 to 30 m.p.h.....	4.50 seconds— Low range only
0 to 60 m.p.h.....	15.10 seconds—High drive range
	14.90 seconds— Low drive range
Top speed (by speedometer).....	98-100 m.p.h.
	Actual top speed about 6 per- cent less (speedometer variation)

located under the front seat offers equal distribution and is extremely good.

Headroom is exceptionally good and the driving position is comfortable, as are the cushions, although they could be slightly longer to give more support under the knees, which would be more restful for a long-legged six-footer like myself. The windshield is of two-piece construction, which is usually more economical for replacement than the curved, one-piece type.

The engine has a high compression ratio of 7.7 to 1 (6.8 to 1 on models with conventional transmission), is extremely smooth and, in spite of the apparently gaining popularity of the V-8 engine, 66 percent of the Pontiac owners in our poll prefer a straight eight. Gasoline mileage is good for a car of its size and weight (see economy chart).

The brakes are good. The emergency brake is easily operated by the left hand and a pivoted bracket acts as a guide for the cane-handle lever. The pivoting seems to eliminate any binding and makes for ease of operation. An excellent feature is a small electric warning light which flashes on and off when the hand brake is applied and the ignition switch is on. There is, of course, no clutch pedal but the single pedal for the brake was not made wider.

The Dual-Range Hydra-Matic transmission (new this year) is definitely an improvement, although the changes in shifts

(Continued to page 266)



Preferred at Famous

TRUCKEE RIVER, NEV.—Nevada is famous for both its matrimonial divorce mart and the battling brown trout who lurk in Truckee River waters.

In the waters of the Truckee River . . . in the famous fishing spots of outdoor America . . . anywhere and everywhere that fishermen fish—and catch 'em . . . you'll find H-I tackle preferred for its quality, dependability and value. Buy H-I—at your dealer's. Horrocks-Ibbotson Company, Utica, N.Y. Manufacturers of the largest line of fishing tackle in the world.

Registered

H-I—the oldest and largest builder of fishing rods in America, offers you a complete line of bamboo, H-I Power Glass, solid and tubular steel rods for fly, bait casting, spinning and salt water fishing. Compare them for quality and value with any rods you've ever used.



OLD HI'S HI TEST—Compare it with the finest. \$50.00.
VERNLEY—Lite, live action, fine balance, moderate price. \$30.00.
CANADA CREEK—Greatest quality fly rod value on the market. Price \$25.00.

OLD GOLD (level or tapered)—New impregnation process gives this line of selected silk a wear-resistant, glass-smooth finish. 25 yd. coils. Level: \$2.10—\$3.20. Tapered: \$8.85—\$11.00.

DRY FLITE (level or tapered)—Smoother casting, longer lasting. A top grade fly line of Dupont Nylon, oil impregnated. 25 and 30 yd. coils. Level: \$1.30—\$2.50. Tapered: \$7.50—\$8.00.

HORROCKS-IBBOTSON CO., UTICA, NEW YORK

Fishing Spots



For your protection, Custom-crafted H-I Registered Fly Rods each bear their own registry number. When you buy one, your dealer sends its number and your name to H-I's Registered Rod Dept. where they become a permanent record.

Fly Rods..

UTICA AUTOMATIC—A fishing tested "streamliner." New upright model. Free stripping . . . lightest weight, largest line capacity of any auto reel made. \$8.50.



OLD HI SAYS—"As one fisherman to another, better buy H-I." Write for my free books: "Fishing for the Millions," "Salt Water Sports Fishing" or "Pacific Coastal Fishing." Horrocks-Ibbotson Co., Utica, N.Y. Dept. 23.



Put Springtime in Your Engine

TUNE IT UP WITH MIRACLE POWER

Thousands of motorists know that the use of Miracle Power in gas and oil keeps springtime in their engines . . . tunes them up . . . saves gas . . . increases power . . . restores new car zip.

That's because Miracle Power gives your engine the recognized lubricating qualities of colloidal synthetic graphite in suspension. This special graphite forms a breathlike,

protective film which clings to metal after oil drains off during stops . . . lubricates vital parts . . . minimizes friction and acid etching . . . gives your car top performance. And the graphite film helps oil to maintain a better compression seal, thus increasing power.

Try Miracle Power next time you get gas.

Miracle Power Division

THE AP PARTS CORPORATION
 758 AP BUILDING, TOLEDO 1, OHIO



At better service stations, garages and car dealers, or use this coupon for introductory offer.

Now! Push Button Lubrication!

Miracle Power Pres-A-Luber is ideal for car engines as well as general household lubrication. Just push the button for a fine Miracle Power spray that reaches all the hard-to-get-at places.



Also available are Pres-A-Lubers containing dcf 123—companion product to Miracle Power for use as a dry pre-lubricant during engine re-assembly.

THE AP PARTS CORPORATION
 758 AP BUILDING, TOLEDO 1, OHIO

Enclosed find \$.....for which please send me postpaid:

..... trial cans of Miracle Power at 75c each (1 for gas, 1 for oil)
 Please send me free literature on making my car last longer.

Name _____

Address _____

City _____ Zone _____ State _____

If you like
fine tools



...get



The minute you take hold of a GREENLEE tool, you can "feel" the fine quality and extra craftsmanship that goes into its making. And when you put it to work, you'll immediately see how GREENLEE tools are built to speed your jobs and help you finish them off with a skillful touch.

The next time you buy Auger Bits, Chisels, Gouges, a Spiral Screw Driver, an Automatic Push Drill, a draw knife, or other fine hand tools... "get GREENLEE" . . . at better hardware and building supply dealers across America.



HANDY WOODWORKING CALCULATOR... ONLY 25c
Converts linear to board feet, gives nail specifications, tool sharpening tips, compares woods, answers countless other questions in seconds.

GREENLEE TOOL CO., 2105 Columbia Avenue
ROCKFORD, ILLINOIS. Enclosed is 25c (not stamps), send Handy Calculator to:

NAME.....
ADDRESS.....
CITY..... STATE.....

seemed more noticeable than in the previous Hydra-Matics, especially when downshifting. Actually, the driver has the option of two driving ranges. He may choose either high or low driving range with the selector lever, as the shift indicator has been split into two positions—1-2-3-4 (actually four speeds forward—No. 4 compares to an overdrive for cruising), positioned to the left of "DR." It is excellent for highway cruising and more economical.

Speed in the low range is, of course, slower than in high range. However, the amazing top speed in low range was 77 to

1952 PONTIAC SPECIFICATIONS

ENGINE

	6-cylinder	8-cylinder
Type	In-line, L-head	In-line, L-head
Bore and stroke	3-9/16 in. x 4 in.	3 3/8 in. x 3 3/4 in.
Piston displacement	239.2 cu. in.	268.4 cu. in.
Brake horsepower	100 (or 102*)	118 (or 122*)
Compression ratio	6.8:1 (or 7.7:1*)	6.8:1 (or 7.7:1*)
Transmission	3-speed conv. (3.90:1 rear-axle ratio). *Optional on all models at extra cost is G. M. Hydra-Matic Drive with Dual-Range shift control and an extra-high rear-axle ratio (3.08:1), in which case the high-compression engine is standard	

GENERAL

(Figures on 4-dr. sedan models)

Steering ratio	19:1	19:1
Steering wheel, lock to lock	4 1/2 turns	4 1/2 turns
Turning radius	19.79 ft.	19.79 ft.
Road clearance	8 1/8 in.	8 1/8 in.
Tire size	7.10 x 15	7.10 x 15
Recommended tire pressure	24 lb.	24 lb.
Weight (unladen)	3403 lb.	3503 lb. (with Hydra-Matic)
Wheelbase	120 in.	120 in.
Tread, front	58-1/16 in.	58-1/16 in.
Tread, rear	59-1/16 in.	59-1/16 in.
Height, over-all	65 3/8 in.	65 3/8 in.
Width, over-all	75-11/16 in.	75-11/16 in.
Length, over-all	202 1/4 in.	202 1/4 in.

INTERIOR DIMENSIONS

Front-seat width	59-15/16 in.	59-15/16 in.
Rear-seat width	58 1/2 in.	58 1/2 in.
Headroom, front	36 in.	36 in.
Headroom, rear	35 1/2 in.	35 1/2 in.
Legroom, front	42-9/16 in.	42-9/16 in.
Legroom, rear	40-11/16 in.	40-11/16 in.

CAPACITIES

Oil	5 qt.	5 qt.
Water	18 qt.	18 qt.
Gasoline	17 1/2 gal.	17 1/2 gal.

80 miles per hour by speedometer. An extremely low gear is available where utmost power is needed for hills, snow or mud.

There is a tendency for the car to "creep" while standing with engine running when the lever is in "drive" position. The shift lever does not have a parking position, a feature many drivers would appreciate. A light on the shift indicator would be an improvement and, until the driver gets accustomed to the Dual-Range lever positions, there is apt to be some confusion because the high range and the low range are not indicated separately except by two small

(Continued to page 268)

IT'S LEJAY FOR WAR SURPLUS — BARGAINS GALORE

HYDRAULIC EQUIPMENT

No. 8—Double Action Cylinder 1 1/2" bore, 5" stroke, 1/2" shaft. Lifting capacity 1760 lbs. with 1000 P.S.I. input. Overall length 15 3/4". Ball bearing mounts. **\$7.95** on both ends.

No. 6—Double Action Cylinder 1 1/2" bore, 26" stroke, 1" shaft. Lifting capacity 1760 lbs. with 1000 P.S.I. input. Overall length 35". Bolt mount at bottom, clevis at top. **\$55.00** Value—now **\$15.95** only

No. 3—Double Action Cylinder 3" bore, 24" stroke, 1-3/16" shaft. Lifting capacity 7070 lbs. with 1000 P.S.I. input. Overall length 34 1/2". Clevis mount both ends. **Cost Gov't. \$176.00** Only **\$27.50**

No. 2—(As Illustrated) Double Action Cylinder 4" bore, 18" stroke, 1 1/2" shaft. Lifting capacity 12,500 lbs. with 1000 P.S.I. input. Overall length 30 1/2". Clevis mounting at bottom. threaded shaft at top. **Cost Gov't. \$29.75** over **\$300.00—Special...**

No. H.12—Hand Pump with handle. Built in check valve—Capacity 2000 lbs. Pressure. **\$55.00** Value... **\$11.25**

No. 194—Pescio Type pump for oil, water, air, 1/2" pipe thread ports. Splined self-aligning shaft. **\$12.50**

No. 211—Pescio Type pump for oil, water, air, 1" pipe thread ports. Splined self-aligning shaft... **\$15.25**

WELDER SPECIAL!

Yours for only **\$67.90** Assemble Yourself



Powerful 200-250 ampere Welder built for light or heavy duty work. Heavy duty Aircraft Generator. Built in Arc-Stabilizer and HI-LO switch with dial control. Complete with all parts including pulley as shown and ready for assembly (You save \$29.60) **No. AW9 Kit complete... \$67.90**
(2 or 3 jobs quickly pays for it.)
Same Welder, Factory assembled ready to go. **Part No. 100... \$97.50**

Accessory Kit
EXTRA! A \$14.95 Accessory Kit Complete for only \$12.95! Includes Welding Helmet, Electrode Holder, 5 lbs. Ass't Rods, Two 10 ft. Welding Leads with terminals and ground clip, plus Auer's Welding Guide. Sold with any Welder Kit... **Special Price \$12.95**

VICKERS PUMP
Item E. No. VP52—Vickers Positive Replacement Hydraulic Pump. Pumps .507 cu. in. per rev. 8 gals. per min. at 3750 R.P.M. 1000 P.S.I. Ship wt. 5 lbs. **\$19.49**

ORDER FROM THIS AD

MOTOR GEAR UNIT

No. E9—Eclipse 24V. motor gear unit. Gear ratio 4 to 1. Can also be adapted for 2-1 or 40-1 ratio. Gear unit with separate A. C. Motor makes perfect garage door opener, hoist, pump jacks, hay lift, etc. Works good on 8 or 12 volts. **Cost Gov't. \$21.00**—write a few lines. **\$12.95**

32 VOLT D. C. MOTOR

New Century Ball Bearing Motor 1/8 H.P. 1750 R.P.M. Compound wound, 6.4 Amps, Totally enclosed with base. **Regular \$35.00** Value. Our Special **\$24.95**

SPECIAL MOTOR

A 1/2 H.P. Emerson 24 volts D.C. motor, self contained fan, 4000 R.P.M. Delivers 1/10 H.P. on 8 volts 500 R.P.M. or 1/4 H.P. on 12 volts 1800 R.P.M. A real buy... **\$5.95**

MOTOR GENERATOR

General Electric or Emerson Amplidyne Motor Generator. Input 27 volts at 44 amps., 7,500 R.P.M. Output 60 volts 8.8 amps., with booster. Excellent for portable light plant. **Cost over \$140.00. Our price. \$7.50**

115 Volt A.C. Motor

New DeLco Ball Bearing Motor 1/4 H.P. split phase 1725 R.P.M., 60 cycle 115 volts for vertical or horizontal mounting. With 3 1/2 foot heavy rubber cord and safety switch. Very Special at... **\$16.45**

MONEY BACK GUARANTEE — Send Check or Money Order—or small deposit and we will ship C.O.D. Catalog of additional Surplus Bargains upon request.

LEJAY MANUFACTURING CO., INC.
747 LeJay Bldg., Minneapolis 8, Minn.

MADE IN FINLAND • **GENUINE FINNISH HUNTING KNIFE**
IDEAL FOR • CAMPERS • BOY SCOUTS • FISHERMEN • HUNTERS • A \$6.00 VALUE

Of finest hand-forged Swedish steel honed to a razor edge... with hand made, saddle stitched genuine leather sheath. A Sportsman's treasure! Beautifully etched, 3 3/4" blade with blood grooves on both sides. Overall length 7 3/8". Colorful handles in genuine moisture-proof birch wood.

2.95 POSTPAID

DALO CO., Dept. PM
2449 N. Western Ave., Chicago 47, Ill.

FREE CATALOG of unusual, interesting and some hard-to-get items—write now!

SAY YOU SAW IT IN POPULAR MECHANICS

ADD BEAUTY and VALUE to YOUR HOME with beautiful wood-paneled walls

Install Plankweld yourself, quickly, easily—in genuine Philippine mahogany, oak, birch, knotty pine—for as little as \$60 for an average wall.

Plankweld is Weldwood® Plywood pre-cut to room height in 16 1/4" wide panels. Edge-grooved to provide a neat lap joint. Pre-finished—no staining or waxing required.

See Plankweld at your lumber dealer.

PLANKWELD®
Manufactured and distributed by UNITED STATES PLYWOOD CORPORATION
55 West 44th Street, New York 36, N. Y.

MAY 1952



Free to mechanics

DURO-CHROME TOOL CATALOG

NEW pocket-book of tool "best sellers"

Send today for this Pocket-Size Catalog filled with pictures and descriptions of Duro-Chrome Quality regular and special tools, preferred by professional mechanics, and on sale at your dealer's. Also contains tool tips that help make you a better mechanic. All yours without cost or obligation.

also makers of nationally advertised **DURO POWER TOOLS**

clip this coupon now to get **FREE** copy
MAIL TO DURO METAL PRODUCTS COMPANY
2649 N. Kildare Ave. Chicago 39, Illinois.
Write your name and address in margin space

New, faster way to strip off finishes



Non-inflammable
KLEAN-STRIP
peels off paint,
varnish, lacquer,
enamel, synthetics.

IT'S CLEAN—NO AFTERWASH!

Sold at leading paint, hardware and
department stores.

Product of
W. M. BARR & CO.
2360 S. Lauderdale, Memphis 2, Tenn.

No Monkey Business

NO POURING...NO PUMPING...NO PRIMING
with
INSTANT LIGHTING

PREPO

America's best liked torch!

25 ways better...
for better results

Hotter Easier Safer Faster

Using
Throw-Away
Fuel Tank

Complete
information
at your
dealer!



arrows. There is no marking to show which one is low and which is high.

The steering is rather stiff, which many drivers will like, and the ratio is not bad for a car of its size and weight by American standards.

The test car had rather stiff springs and the ride was not as comfortable as I had expected, although when the car is loaded this condition would naturally change. The trunk space is ample and the lid is counterbalanced and self-locking. The hood also is counterbalanced. A clever gadget under the hood is an engine floodlight which goes on when the hood is opened.

The car had the new blue-tinted glass which seems to be gaining in popularity. The heavy blue panel at the top of the windshield is a real advantage when driving through snow or bright sunlight but is a disadvantage at twilight.

According to our survey of Pontiac owners, many persons regard Pontiac as the reliable "work horse" of the G.M. family.



Portable Microfilm Viewer Weighs Only 17 Pounds

Folding for easy portability, a desk-top reader for microfilm requires no darkened room. Under ordinary room light, the projected image shows up sharp and clear on an 18 by 18-inch screen. This screen permits a 17-power magnification of the microfilm. If desired, the image can be projected on a larger vertical screen or on a light-colored wall for group reading. The complete unit weighs only 17 pounds with its case, in which there is space for screen, lens, rolls of microfilm and an extra projector lamp.

☐ In 1951 the prefabricated-housing industry sold 50,000 ready-built homes with an estimated total value of \$382,630,000.

Records as it rolls!

**FASCINATING
DISTANCE MEASURE**

For motorists, engineers, architects, teachers, draftsmen, traveling men, service men, yachtsmen. Dependable product of German craftsmen famous for precision accurate instruments. Gauges on both sides measure exact distances between any locations, on any scale, American or foreign. With handsome leather case.



\$3.75
postpaid.

Send Check or Money Order
10-day money-back guarantee
Dealer Inquiries Invited.

TREASURE MART Box 103, 545 5th Ave.
New York 17, N. Y.
Serving Thousands of Satisfied Customers Year After Year

**DRY OUT DAMP
WORKSHOPS!**



Amazing little Fedders Electric Dehumidifier dries damp rooms without messy chemicals! Plugs in like a radio, removes up to 3 gals. of moisture from the air every 24 hours. Stops damage from rust, mildew, rot, warp. Protects tools,

wood, guns, luggage, furniture, linens. Compact and portable. No service worries. Runs for a few pennies a day. Write today for details on 5-day FREE home trial offer. Fedders-Quigan Corp., Dept. PM-3, Buffalo 7, New York.

fedders

A GREAT NAME
IN COMFORT

MONTH AFTER MONTH, YEAR AFTER YEAR, YOU SEE OUR AD.
REMEMBER IT'S DANGEROUS to pay less if you want the finest (nonskid) USED tires.

GOOD YEAR **Firestone**
GOODRICH, UNITED STATES, GENERAL & OTHERS, NOT RECAPS

Our policy is to select your tires so carefully, as if our very future depended on the service given by that particular tire.
FREE TUBE WITH ANY GRADE TRUCK OR PASS. TIRE (EXCEPT MILITARY TREAD TIRES)

GOOD GRADE TIRES — 16 MONTHS GOLDEN RULE GUARANTEE			
600-16	\$4.14	820-15	\$5.44
650-16	5.42	700-15	4.54
700-16	5.04	670-15	4.74
650-15	4.44	710-15	4.94
760-15	5.04	550-17	4.64
600-20	\$7.14	32x6(8)	\$8.64
650-20	7.94	32x6(10)	9.94
700-20	8.54	900-20	13.94
750-20	8.64	1000-20	13.94
825-20	15.92	1100-20	14.94
FINEST GRADE, 29 MONTHS GOLDEN RULE GUARANTEE BOND THIS GRADE MADE THE BLATT NAME "WORLD FAMOUS!"			
600-16	\$5.29	LO-PRESSURE TRUCK TIRES (8-10-12-14 PLY)	
600-16(8)	6.80	550-15	\$5.60
650-16	6.12	640-15	5.65
650-16(8)	7.75	670-15	5.95
700-16	6.42	710-15	6.17
750-16	7.75	760-15	6.27
525-16	4.92	800-15	5.44
550-17	5.64	820-15	5.80
650-15	5.60	670-16	6.42
700-15	6.05	760-16	6.94
WHITEWALLS 52 ea.	EXTRA	32x6(10)	12.02
		1100-20	19.95

Buy the "Right" **TRUCK TIRES** Std. Guar. 16 Mos. Rugged Guar. 30 Mos.
MILITARY MUD-SNO TREAD

For "Your" Job	750-20 \$10.00	750-20Rg. \$16.64
Depend On Us	600-16 Std. 6.75	800-16 Rg. 9.95
	900-16 Std. 10.00	900-16 Rg. 16.00

BLATT BLATT BLDG., GIRARD & LANCASTER AVES.,
DEPT. PM., PHILADELPHIA 31, PA.
Send check or money order. Save this ad to re-order. We won't ship a tire we wouldn't use. The name to trust in rubber.
Shipments RUSHED Down South, Up North and Far West

FREE PLAN

Tells How to Start
Your Own Business

**FILING
SAWS**



Saws come from 20 and 30 miles

"I rented a two-car garage and have all the work I can do. Some days I start 6:30 in the morning. I get work 20 and 30 miles from my place of business." — Charles H. Smith.

Each Saw Filed Brings Six More

"Each saw I filed got me six more and business has been picking up that way since a year ago. If it keeps up I will have to buy another Foley Saw Filer." — William C. Baldwin.

FOLEY FILED SAWS BRING NEW CUSTOMERS

Here is a steady repeat CASH business you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings you more customers. S. M. Hollingshead wrote to us: "I am doing very well with my Foley Filer, and I am glad I invested in your machinery. It is very satisfactory and works very well in the small community in which I live."

You can file all hand saws, also band and cross-cut circular saws on the Foley Saw Filer. The adjustments are simple — there is no eyestrain — and you can start right away to turn out perfect cutting saws. "The first saw I sharpened with my Foley Filer came out 100%. I think it is a marvel of perfection." — writes Clarence E. Parsons.

FREE BOOK Shows How to Start

"MONEY MAKING FACTS"

explains how you can get business from hardware stores, home owners, farmers, carpenters, schools, mills, factories, etc. Just think — with a modest investment, no overhead, no stock of goods to carry, you can start right in on a cash business that will help pay the rent, buy groceries, or a new car. Start now — send coupon today. No salesman will call.



Send for **FREE BOOK**

**FOLEY MFG. CO., 516-2 Foley Bldg.
Minneapolis 18, Minn.**

Send me free book "MONEY MAKING FACTS."

Name _____

Address _____

They're DYNAMITE

FOR SPINNING OR CASTING



New FIN-DINGO®

FIN-DINGO®—Sensational, slow-sinking, fish-like action. Wt. ½ oz.—\$1.25

WEE-NIPPEE®—Famous Nip-I-Diddee® action. Semi-weedless. Wt. ¼ oz. \$1.35

SPIN-I-DIDDEE® ¼ oz. size Nip-I-Diddee®. Real fish-getter. \$1.25



New WEE-NIPPEE®



New SPIN-I-DIDDEE®



FREE BOOK. 116 pages of helpful hints, new tackle, etc. Write for it now. SOUTH BEND BAIT CO., 807 High St., South Bend 23, Ind.

SOUTH BEND

A Name Famous in Fishing

NEW DREMEL Electric RAZOR BLADE SHARPENER

READ WHAT! USERS SAY!

- "Congratulations on first really top-notch sharpener in my 35 year shaving experience!"—Conn. User
- "Got 87 good, clean shaves from only one blade."—Texas User
- "Sharpening ability wonderful—getting real shaving comfort."—Mich. User
- "Getting the best shaves of my life."—New York User
- "Used only 2 blades in 9 months and every shave a pleasure."—Calif. User

(USERS' NAMES ON REQUEST)

These are typical results from the Dremel Sharpener. Thousands of double-edge blade users get smoothest shaves of their life . . . months of perfect shaving from only one blade! All possible because it hollow-hones and straps to sharpest edges ever in one 15-20 second operation. Do like others—prove it to yourself on a money-back guarantee!

UNIQUE FATHER'S DAY GIFT

Any man will be thrilled with the years of shaving comfort. It's a precision instrument tested to the equivalent of 20 years' daily use by one man. All-plastic housing 2 1/2" x 3 1/4" x 3 1/4"; 110-120 V., AC-DC. Sharpening rollers will last many years—replaceable when necessary at nominal cost. Double-edge blades only.

MONEY-BACK GUARANTEE OFFER—Send check or money-order for return Sharpener in good condition within 10 days for prompt refund. Order yours today!

DREMEL MANUFACTURING COMPANY, Dept. 112-E, RACINE, WIS.



10 Day Trial

FOR FASTER WORK IN HOME OR SHOP . . .

HOLD-E-ZEE

The Original - AUTOMATIC GRIP SCREWDRIVERS

Pat'd.

See these popular, high-quality drivers with the exclusive Gripper that holds, starts and sets up screws in unhandy places!

New Models FOR RECESSED HEAD SCREWS ➡ + +

At Leading Dealers Everywhere
UPSON BROS., INC., ROCHESTER 4, N. Y.

\$ Free Course! Big Profits! \$

Flocks & Sandblasts

Only \$24.75 Complete

Dual Purpose Spray Gun! Uses only 25 lbs. Air Pressure

- Thousands of uses in Home, Shop, Industry.
- Makes Auto Interiors Clean & New. Lines drawers, Marproofs lamp bases, Refinishes any object. All in colorful Flock. Etch & Frost windows, glassware, etc. Removes Paint & Rust from Autos, Tools. Guaranteed! Send \$24.75 or write for free information. Flocking supplies!

BLASTO SPRAY GUN MFG.
Dept. PM-10, 7007 Haas Avenue, Los Angeles 47, Calif.

Reduce RADIO NOISES

Simply Plug Radio or Appliance cord

Use Noise Eliminator and plug into wall socket. Enjoy reception FREE from many distracting noises. Send No Money, pay postman \$1.25 each (2 for \$2.00) plus postage or send cash and we'll mail postpaid. Try 5 days, money back if not delighted. Many hundreds of satisfied users. Send for yours today.

MERIT SALES, Dept. E-30, 4225 Eldon Dr., Baltimore 29, Md. \$2.00

NEW CLEAR-TONE LINE-NOISE ELIMINATOR

\$2.00

Clark EXPANSIVE BIT

CUTS BETTER • COSTS LESS!

Accurate, fast; cuts smooth holes in hard or soft wood. Chrome vanadium steel blades, all chrome body. No. 250, 1/2"-1 1/2", \$1.89; No. 251, 7/8"-3", \$2.19. **GUARANTEED.**

At your dealer or write Dept. PM-5
ROBERT H. CLARK COMPANY • Beverly Hills, California

INSIST ON A HULL AUTO COMPASS

BECAUSE . . . there are more Hull Auto Compasses in use than all other makes combined . . . simple comparison reveals the accurate, scientific instrument quality that creates this preference. Write for local dealer's name, free literature.

Beaconlite illuminated \$6.95

STREAMLINE standard \$4.95

HULL MFG. CO. P. O. Box 246-05, Warren, Ohio

FUN FOR EVERYONE!

The Easy Way to Build Your Own OUTDOOR FIREPLACE

Food Cooked Outdoors Tastes Better . . . offers real enjoyment for the entire family . . . perfect for entertaining guests! It's easy and economical to build your own Cook Nook. Just add the masonry (any design you prefer) around the Majestic all-metal unit and start cooking! See your dealer today or send check or M. O.

Model OF-28 only 21" x 26" x 13 1/2" \$20.95

The Majestic Co.
359 Erie St., Huntington, Ind.

SEND FOR free DESIGN BULLETIN!

Big Selection of easy-to-follow designs

Two DREMEL Electric SANDERS with STRAIGHT LINE Action for Guaranteed SCRATCH-FREE Surfaces

POPULAR GIFTS For FATHER'S DAY! Model 2000 **\$24.50**

Dremel Sanders are grand gifts to give or get. Compare them with any similar products made—point-by-point, feature for feature. Then you'll see why Dremel can guarantee more for your money in finer performance and longer life. You be the Judge!

Model 2000 for Heavy Duty Woodworking Projects—



MODEL 2000 PRICE INCLUDES this sturdy steel storage case, 25 asst'd. abrasives, and sheepskin polish pad.

A high-speed, fast-cutting production sander for home and shop use. Its straight-line, *with-the-grain* action is ideal for redecorating jobs, furniture and cabinet making, boat building or refinishing. Great for building operations like woodwork, doors, stairways, dry-wall joints, etc. Also does a superb polishing job! Wt. 5 lbs.; 21 sq. in. sanding surface; over-all size 3 1/4" x 4 1/2" x 7". Finest sander value in the field and fully guaranteed!

BOTH MODELS FEATURE!

Only 2 moving parts; easy one-hand operation; 10-sec. paper change; 14,400 strokes per min., 110-120 V., 60-cycle, AC.



14,400 SANDING STROKES PER MIN.

MODEL "A"

\$14.85

Price includes 6 sandpapers, 1 sheepskin, 1 felt pad

MODEL "A" FOR HOBBIES, REFINISHING, REDECORATING—Dremel's lighter capacity, excellent all-purpose sander for home maintenance, unfinished furniture, hobby projects, etc. Wonderful wax polisher. A soothing massager! Only 2 1/2 lbs. with 12" sanding surface.

WHERE TO BUY—If dealer doesn't carry, remit in full for postpaid shipment. Or send only \$2 now, pay postman balance plus postage and C.O.D. fee. Five-day trial, money-back guaranteed!

DREMEL MFG. CO. Dept. 112-E Racine, Wis.

ONLY STRAIGHT-LINE ACTION SANDS WITH THE GRAIN

Ask any professional woodworker about sanding action. He will tell you that only straight-line, with-the-grain sanding can produce a flawless finish. Follow his advice — insist on Dremel.

BEFORE YOU BUY ANY SANDER

ROTARY Action



ORBITAL Action



ARC Action



COMPARE! STRAIGHT-LINE Action



NEW—AMAZINGLY FAST AND ACCURATE

Featured Editorially Jan. '52 Popular Mechanics



IMPORTED Made by Swiss Watchmakers

"CURTA" PORTABLE CALCULATOR

Does more than calculators costing \$400.00

A NECESSITY FOR EVERYONE WHO WORKS WITH FIGURES

- Carries to Five Decimal Places
- Totals to 99 Billion
- Adds • Subtracts • Multiplies
- Divides • Square Roots • Cubes
- Factors • Percentages

The Curta Calculator combines the portability of a slide rule with the speed and accuracy of large desk calculator.

A fine precision instrument, sturdily built of anodized steel to give years of service. Weighs only 8 ounces. *Absolutely accurate.* Figures can be checked and rechecked on 3 sets of dials — *guaranteed for one year.*

With Rubber Lined Metal Case..... **\$134.70** Tax Included

ORDER NOW CHECK MONEY ORDER OR C.O.D.

MONEY BACK If not satisfied after 10 day trial.

OR WRITE FOR FURTHER INFORMATION

CURTA CALCULATOR CO., 5541 S. Ashland Ave., Dept. M-5, Chicago, Ill.

It's easy! MODERNIZE YOUR HOME THE MONEY-SAVING, "SLIDE-ALL" WAY!

• Now... You can install your own sliding doors... do the complete job yourself... *in just 15 minutes.*

Buy any size door or hardware either separately or in a prefabricated package with no extras needed.

Hardware is overhead track with ball bearing rollers. *Unconditionally guaranteed* for smooth, silent performance by America's largest manufacturer of Sliding Doors.



GET THE FACTS TODAY! SEND COUPON BELOW FOR FULL INFORMATION

SLIDE-ALL COMPANY 2084 First Ave., New York 29, N. Y. PM-3

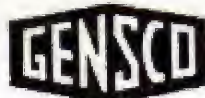
Please send me complete information on DOORS HARDWARE for self-installation.

Name..... (Please print)

Address.....

City..... Zone..... State.....

KNOWN FOR THEIR FINER QUALITY



IMPORTED
SWEDISH TOOLS

WOOD CHISELS

Finest Swedish steel blades with unbreakable, machined plastic handles. Take and hold a better cutting edge. Sizes from 1/4" to 2" widths.

MORA HUNTING KNIVES

Seven models, all with leather sheaths. Hand forged, hand honed Swedish steel blades. Polished curly birch handles.

BUSHMAN BOW SAWS

Fastest cutting saw you can own for firewood and rough work. For campers, home owners, farmers, ranchers. 24", 30", 36", 42" sizes.

AT BETTER HARDWARE STORES EVERYWHERE

GENSCO TOOL DIVISION

GENERAL STEEL WAREHOUSE CO., INC.

1832 North Kostner Ave. • Chicago 39, Ill.

INTERNATIONAL ROTARY
HI-SPEED COPE-SAW DRILL-BIT
IT DRILLS IT SAWS IT REAMS



DRILL, SAW, REAM . . . metal, pipe, wood, plastic, Transite, etc. Use with any electric drill, slow drill press, lathe or milling machine. Drills own starting hole—upper part of bit is used to cut, saw or ream circles, ovals, squares or scrolls. Easy to operate. Ideal for carpenters, mechanics, electricians, plumbers, hobbyists, many others. Abrasive resistant, high speed steel. Flutes ground from solid. Will withstand severe continuous use without breaking. Resharpener at no charge. Takes place of up to \$50 in tools. 1/2" diameter, 2" cutting sections, total length 3 1/2". Also available specially designed for wood or metal and in 2 1/2" and 1 1/2" lengths. Write for details. Specify all-purpose bit. Shipped same day. Money-back guarantee. Dealer inquiries invited.

SEND CASH, CHECK OR MONEY ORDER
Manufactured and distributed by:
INTERNATIONAL TWIST DRILL CORP.

624 Wyandotte, Rm. 631, Kansas City 6, Mo.

only
\$3.95
POST PAID

BATHTUB SHINES!!

WHEN YOU USE
TUB-MASTER
BATHTUB BRUSH

Designed for Husbands and Small Fry

You don't need to be reminded you left the bath in a mess (the tub that is). Just reach for your Tub-Master. A beautiful brush 24 in. long—foam rubber cleaning head—aluminum shaft—non-slip Lucite grip. A quick squeegee and the tub is like new. A \$2.85 Value—INTRODUCTORY OFFER from Mfg.

1.85, plus 15c postage
No COD please,
Satisfaction Guaranteed.

LARRY ATWOOD CO.
1211 Ferndale Ave., Dallas 8, Texas

BUY LU-MAR
ALL-PURPOSE PUMP

To fill outboard motors, lawnmowers, etc. \$3.00 postpaid, less can. Strainer and shut-off, 75c. Money-back guarantee.

LUCAS METAL PRODUCTS CO.
952 Exchange St. Rochester 8, N.Y.



PLASTICS CATALOG

RETAIL & WHOLESALE PRICES

There's more information and tricks-of-the-trade and a larger variety of plastics materials listings packed into this catalog than you've ever seen before. Sheets, rods, tubes, casting, molding plastics, supplies, findings, etc. We make our own Carving Dyes. "Gem-Coat" Fiberglass and Polyester coating for wood boats. For fast, courteous, personalized service, TRY US! CATALOG 10c—or airmailed for 25c in U.S.

GEM-O-LITE PLASTICS CO.
5350-B Riverton Ave. North Hollywood, Calif.

Print Your Own

Cards, stationery, circulars, tags, labels, photo and movie titles, advertising, etc. Save money. **Print for Others, Good Profit;** easy rules sent. Raised Printing like Engraving, too. Sold direct from factory only. Write for free catalog of outfits and all details. **KELSEY PRESSES, M-37, Meriden, Conn.**

SAVE MONEY-ON PAINTING

FREE BOOK TELLS how to get better paint results at no extra cost. Given free by America's leading aluminum producer so you can get full value and satisfaction from aluminum paint. Written by experts . . . packed with facts . . . write for "Paint it Bright."

Aluminum Company of America, 1718E Gulf Bldg., Pittsburgh 19, Pa.



NEW—Sensational! GEIGER COUNTER



"The SNOOPER"

LOW PRICE ONLY **\$24.95**

COMPLETE

Find a fortune in uranium with this new, super-sensitive Geiger Counter. Get one for atom bomb defense. So small it fits in the palm of the hand or in the hip pocket, and yet more sensitive than many large, expensive instruments. Weighs only 1 1/4 lbs. Uses flashlight battery. Low price includes earphone, radio active sample, instructions. Sold with ironclad moneyback guarantee.

ORDER YOURS TODAY—Send \$5.00 with order or payment in full to save C.O.D. Write for free catalog on treasure finders for gold, silver, etc. and larger, more elaborate Geiger Counters.

Dealer Inquiries Invited **PRECISION RADIATION INSTRUMENTS**
4113 PM W. Jefferson, L. A. 16, Calif.

Imagine! REAL Linoleum
in "Do-it-yourself" TILE!

New PABCO LINOLEUM TILE!



9-inch squares. Many lovely colors. 3 qualities. Starting at **12¢** per tile!

Compare PABCO linoleum tile with rigid tiles:

- ✓ More COMFORTABLE underfoot
- ✓ Smarter, truer COLORS
- ✓ More attractive DECORATION
- ✓ Easier to keep CLEAN
- ✓ A QUIETER floor
- ✓ NOT BRITTLE—won't crack
- ✓ Greater SOIL-RESISTANCE
- ✓ Easier to INSTALL



PABCO PRODUCTS INC.
475 Brannan Street
San Francisco, Calif.



Complete the picture with
"Do-it-yourself"
WALL COVERING
in related colors...

"PABCOWALL"

— pastes over any wall surface. Made in 54" rolls, 14 colors, 3 styles, with base & cap strips. Rivals expensive individual tile, but costs only about

15¢ per sq. ft.



HOT WATER

From ANY COLD WATER FAUCET!

only \$4.98

INSTANTLY—Yes, you can now have continuously running HOT water with the JET INSTANT HOT WATER HEATER, in kitchen, summer cottage, camp, office, factory or farm. Regulates from LUKEWARM to REAL HOT with a turn of the tap. A cinch to attach . . . No tools needed. 110 Volt AC DC. Durably constructed of gleaming chromed steel and porcelain. 8 foot U.L. Cord.

10 DAY MONEY BACK GUARANTEE!

Send only \$1.00 deposit, balance C.O.D. plus postage. Send \$4.98 and we pay postage. THE JET must give you satisfactory service!

SUCCESS PRODUCTS

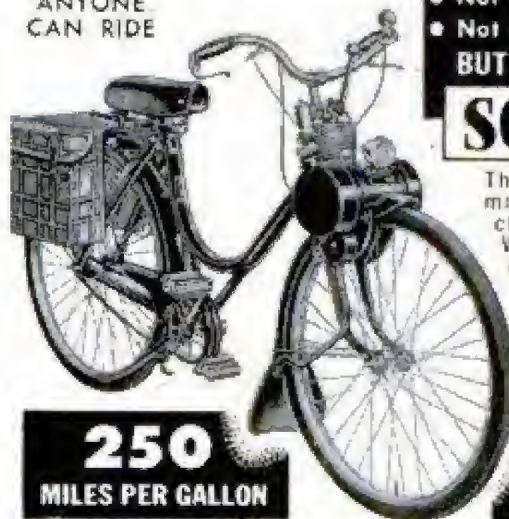
246 Roebing St., Dept. 306, B'klyn 11, N. Y.

WORLD'S LOWEST PRICED MOTOR ASSISTED BICYCLE

ANYONE CAN RIDE

- Not an Attachment
 - Not a Motorbike
- BUT A GENUINE**

SOLEX



The mechanical marvel of the cycling industry! World's most dependable engine — only 3 moving parts. No clutch, no transmission, no belts, chains, gears.

250
MILES PER GALLON

ONLY \$139
F.O.B. K.C. Mo.
(Plus Excise Tax)

The world's largest selling Motor Assisted Bicycle — over 1/4 million in use! Even safer than a bicycle. SOLEX is so simple to operate every member of the family will use it. Smartly styled with the latest European Open Type frame. The trouble-free SOLEX engine is so simple any youth can service it. Quiet and clean as a sewing machine. Mail Coupon TODAY!

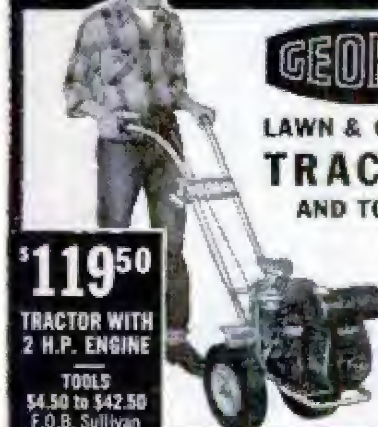
UNCONDITIONAL GUARANTEE

SEND FOR FREE CATALOG

HOLIDAY PRODUCTS, INC.
2802 WARWICK • KANSAS CITY 8, MO.

NAME _____
ADDRESS _____
CITY _____ STATE _____

take it easy! **LAWN & GARDEN LABOR SAVER**
10 IMPLEMENTS IN ONE!



GEORGE

LAWN & GARDEN TRACTOR AND TOOLS

- Plows - Tills
- Hoes - Harrows
- Cultivates
- Mows lawns
- Cuts weeds
- Dozes dirt
- Blows snow
- Portable power unit

Rugged! Easy to handle! Quality engineered, fully guaranteed! Compare with others at \$50 to \$75 more. See your dealer or write for Folder 23.

GEORGE GARDEN TOOL DIV.
Community Industries Assn.
Sullivan—Illinois

\$119.50

TRACTOR WITH 2 H.P. ENGINE

TOOLS \$4.50 to \$42.50
F.O.B. Sullivan

**a RULE you
can
depend
on!**



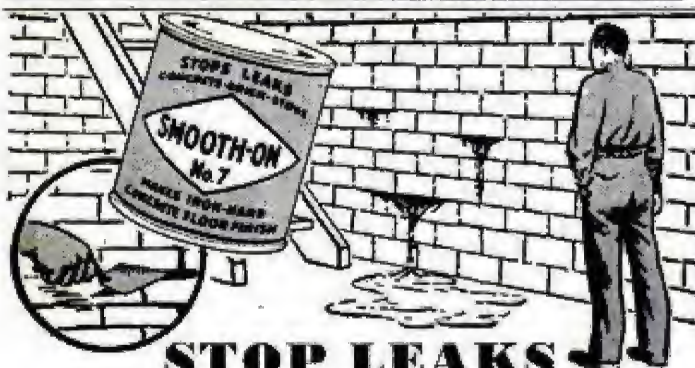
Save money with a folding wood rule that's tough—THE GUARDSMAN by Master. Guaranteed for a full year against clamp failure because the "Safe-Lock" spring action clamp

won't stretch, won't slip, won't sag, won't stick. Moisture-proof because entire rule, including clamp seats, is triple-sealed. Brass joints, (stainless steel spring) straight-grain maple sticks. Convenient two-way reading. Regular (#996) or flat reading (#996F), only \$1.50. Get THE GUARDSMAN at your hardware store today.



MASTER

MASTER RULE MFG. CO. INC. Middletown, New York
WOOD AND STEEL TAPE RULES



**STOP LEAKS
IN CELLAR WALLS**

Do it with Smooth-On No. 7 Cement! Apply with trowel or stiff brush to leaky cracks, holes, porous spots, seams or other leaks in concrete, brick or stone walls and floors. The leaking will stop and Smooth-On will "stay put", for it expands slightly as it hardens. May be applied to wet or dry surfaces, indoors or outside. Use Smooth-On No. 7, too, to seal openings around pipes passing through walls. Buy Smooth-On No. 7 by name and number in 1-, 5-, 20- or 100-lb. size. If your hardware store hasn't it, write us.

FREE Leaflet and Handbook

We'll send you leaflet showing No. 7 uses, also the famous 40-page Smooth-On Repair Handbook describing other Smooth-On Cements and showing many helpful home repairs. 170 illustrations. Write today.

SMOOTH-ON MFG. CO., Dept. 37-E
570 Communipaw Ave., Jersey City 4, N. J.

Do it with

SMOOTH-ON
NO. 7 CEMENT



**MY FALSE TEETH
STAY TIGHT** EVEN

AFTER DRINKING HOT COFFEE!

● Mrs. J. P. writes: "I was delighted to find Staze held my teeth tight *even after hot coffee!*"

Staze is fluid-resistant . . . contains "aquatrol," which holds back moisture penetration. Thus, it holds false teeth tighter, longer. With Staze, thousands now bite into corn and steak—enjoy all the hot coffee they want.

Even if plates are old and loose, Staze holds them tighter. Many denture wearers say that with Staze old plates seem to hold better than when new. At drugstores, or write STAZE, Box PM-4, Stamford, Conn., for free tube.

MARCOT KEY MACHINE



Immediate Delivery

A. J. MARCOTTE CO., 1200 N. Kedzie Ave., Dept. PM, Chicago 51, Ill.

MARCOT No. 8 KEY MACHINE, less motor . . . \$110.00
Auto Code Book and Depth Keys . . . 12.50
75 Dz. Popular Key Blanks . . . 60.00
Set — Key File, Follow-Through Rods, Lock Picks, Bit Key Gauge, Thumbie, Pins, Springs . . . 10.50
"Locksmith Trade Books" . . . 6.75
How to Open Locks without Keys or Picks; Secret of Locksmithing; How to Make Keys by the Impression Method; Master Key Systems.

TOTAL COST . . . \$199.75

VARIABLE SPEED HYDRAULIC POWER TRANSMISSION



DIRZIUS MACHINE SHOP "B" 1423-25 So. 52nd Ave., Cicero 58, Ill.

It has Infinite Speeds 0 to 550, Reverse, Automatic Overload Protection; Adjustable Torque up to 180 inch pounds. 3/4" input and Output Shafts. It will handle 1/2" to 1 1/2" H.P. Motor. Case measures 7 1/2" long, 7" high 8 1/2" wide. VALUE OVER \$300. Shipping Wt. 25#. On C.O.D. Orders we require a 10% only \$54.50 Feb. Chicago Deposit.

DEPENDABLE CRAFT SUPPLIES

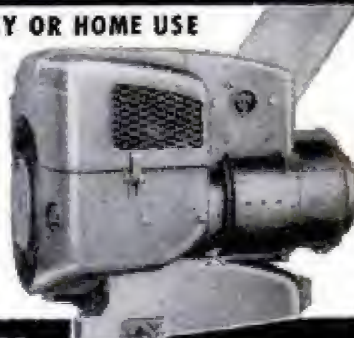
LEATHER CRAFT • PLASTICS • POTTERY CRAFT • BLOCK PRINTING • BELT CRAFT • TEXTILE COLORS • POWER TOOLS • WOOD BURNING • INSTRUCTION BOOKS • ETC.
DWINNELL CRAFT SHOP
Dept. PM-552 — Wheeling, W. Va.

Gerstner TOOL CHESTS
Better, Finer Chests for the good tools of Machinists and Toolmakers. Free Catalog.
GERSTNER TOOL CHESTS
452 Columbia St. Dayton 7, Ohio

ELECTRICITY Anywhere

FOR PORTABLE, EMERGENCY OR HOME USE

ONAN Electric Plants generate 110-volt, 60-cycle current for homes, farms, cabins and resorts beyond the highline. Lightweight, portable plants cut costs, speed work for contractors. Standby plants protect units against power failure, 400 to 55,000 watts. Gasoline or Diesel-powered. Priced from \$219.00.



WRITE FOR CATALOG
D. W. ONAN & SONS INC.
5857 UNIVERSITY AVE., MINNEAPOLIS 14, MINN.

Painting?

Make it look like new!

When painting, make the new finish adhere smoothly—without "crawling." Merely dampen a cloth with WIL-BOND and wipe over the old finish . . . All dirt and grease are removed . . . The gloss is dulled . . . And a slight tack remains to tightly bond the new finish. Result—a job that looks like new! Far easier than washing or sanding the surface. Get Wil-Bond at better paint and hardware dealers.



Write for leaflet

WIL-BOND

Wilson-Imperial Company, 128 Chestnut Street, Newark 5, N. J.

MONEY MEN ALL FREE

THE PLASTEX industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastic and Marble imitation. Experience unnecessary. 1/2c material makes regular the store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big Chain Store Orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. A
3400 Third Ave. New York 56, N. Y.

Tune in the
AUTO-LITE
Show

"Suspense!"

CBS Radio Mondays
CBS Television Tuesdays

BULL DOG JACKS

Makes parking or hitching trailers and heavy farm implements an easy, one-man job

All steel construction—heavy duty ball bearing swivel action . . . raise and lower with crank . . . complete with bracket, ready to install

HAMMER BLOW TOOL COMPANY

Wausau 13E Wisconsin

Model
No. 60-F
Only \$15.75
Post Paid
(when paid
in advance)

MODERNIZE YOUR GUN WITH Franzite GRIPS

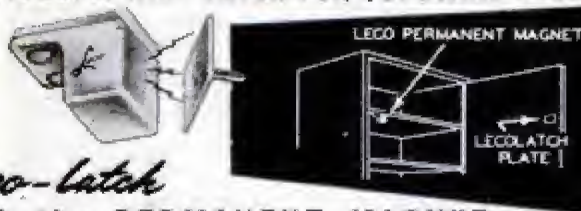
IMPROVE YOUR SCORE

Franzite Grips are positively unbreakable—most durable made. Offered for Colt, Smith & Wesson, Hi-Standard, Ortgies, Luger, Mauser, other domestic and imported guns. Wide choice of smart designs in Ivory, pearl, walnut, onyx, agate, black and a few target, staghorn and curved grips. Low prices! FREE NEW CATALOG. Dealers wanted.

SPORTS, INC. (MFRS.) 5501 Broadway, Dept. 2H-5, Chicago 40, Ill.



A REVOLUTIONARY CATCH FOR CUPBOARD DOORS!



Leco-latch

with the PERMANENT MAGNET

No Moving Parts • No Springs • Absolutely Trouble Free

Utilize the continuous energy of the Permanent Magnet. It will work for you silently and efficiently for the rest of your life! Lasts forever—nothing to get out of order. . . Works perfectly—even if doors sag or warp. . . Doors open easily—without snap, noise or jerk. . . Holds doors in place firmly, yet gently. . . Easily installed. . . Improves appearance.

See your local lumber or hardware dealer, or write to

LABORATORY EQUIPMENT CORPORATION ST. JOSEPH 12, MICHIGAN

Less Wishin'
More Fishin'
WITH Hydro-drive!



Hydro-drive
Champion

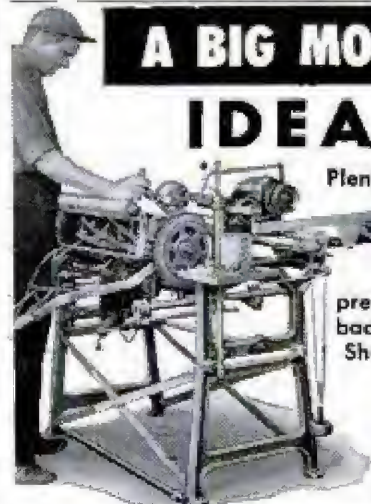
Independent Propeller Control Hydraulic Clutch

OUTBOARD MOTORS
FORWARD • NEUTRAL • REVERSE
without shifting gears!

CHAMPION MOTORS CO., MINNEAPOLIS, MINN.

A BIG MONEY-MAKER

IDEAL LAWNMOWER SHARPENER



Plenty of business in your community—for a big, steady income! Cash in with the IDEAL Model 300—a rugged, precision sharpener, easy to use, backed by 50 years of experience. Sharpens all mowers. Start now, full or spare time. Write for free catalog today.

THE FATE-ROOT-HEATH COMPANY

Dept. R-3, Plymouth, Ohio

YOU TOO CAN START A \$40 A DAY BUSINESS IN YOUR SPARE TIME!



Andy Phillips says:

"MY BELSAW CIRCULAR SAW SHOP gives me BIG PROFITS at LOW expense... I can run 35 to 40 saws in an 8-hour day... That makes me \$40 cash."

FREE BOOK TELLS HOW

You can start this REPEAT CASH business in your own home or garage, while you are working at your regular job. Easy to operate, no experience needed. "Pays for itself from just 65 saw jobs." — *Harvey Jensen.*

For as little as \$15 down payment, you can get your BELSAW CIRCULAR SAW SHOP rushed to you.

You can make \$4 to \$5 an hour in your SPARE TIME sharpening and setting CIRCULAR SAWS for builders, lumber yards, factories... No Extra Equipment needed, no canvassing. Send postcard today for your Free copy of "Life Time Security."

BELSAW MACHINERY CO
3704 Field Building Kansas City 2, Mo.



send for FREE CATALOG



America's Foremost money-making MECHANICS' TOOLS

It's easy to own the same "pay-off" tools used and endorsed by America's top-earning mechanics throughout the automotive, aviation and industrial fields! Snap-on tools help you handle every repair job faster, easier, better. And they LAST... pay for themselves over and over again! Start building your own tool set now with basic Snap-on units—add others any time. Genuine Snap-on tools are never sold in stores—direct to users only. Mail coupon for free catalog.



SNAP-ON TOOLS CORPORATION
8062-E 28th Ave., Kenosha, Wisconsin
Send me free catalog of Snap-on tools.

Name _____
Address _____
City _____ Zone _____ State _____



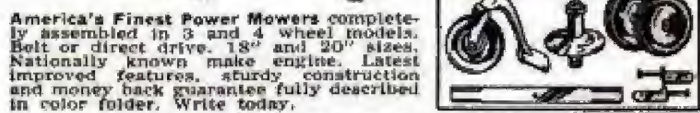
HAND PRINT MOULDING KIT

IT'S NEW — IT'S FASCINATING
YOUR CHILD'S hand print (ages 2 to 6) deeply embedded in attractive BOOK ENDS. By following simple instructions you can develop the Hobby you always wanted. A lasting pleasure to have your own children's hand prints. Profit when you make them for other proud parents.

COMPLETE KIT WITH INSTRUCTIONS
3.50
Postpaid
No COD Please
Satisfaction Guaranteed
LARRY ATWOOD CO.
1211 Ferndale Ave.
Dallas 8, Texas

POWER MOWERS & KITS FREE PLANS

LOW FACTORY COST KITS, Parts, Engines. Free Plans guide you. 3 and 4 Wheel Kits, complete. Parts precision finished, ready to use. Write TODAY for Free Plans, Low Prices, Parts List and Guarantee.



▼ TRIANGLE MANUFACTURING CO., Box M-13, Fort Scott, Kansas

MAKE YOUR OWN!

GRIFFIN LEATHERCRAFT KITS
Best assortment of tools, materials in U. S. A. Send 25¢ for 116-page catalog. (money refunded first order)
GRIFFIN CRAFT SUPPLIES
SINCE 1924
5626-A Telegraph Ave., Oakland 9, Calif

FREE 5 DAY TRIAL—SEND NO MONEY!

SKIL HOME SHOP TOOLS
Save money on home remodeling, add jobs around the house. Skil Tools do the job 10 times faster. ORDER NOW—PAY ON TIME—NO EXTRA INTEREST OR CARRYING CHARGES. Send for tool wanted, receive 5 days, if not satisfactory return of no obligation, or send Down Payment and pay balance in 5 equal monthly payments.
1/4" Jacob Coated Chuck DRILL \$4. down, \$2.45 mo.
6" SAW \$12. down, \$9.50 mo. 6" POLISHER & SANDER \$7. down, \$4.05 mo. 2 1/4" BELT SANDER \$15. down, \$10.40 mo.
FREE information on SKIL Home Building Plans.
S & S INDUSTRIES
Dept. T-3, 177 Louis Street, Maywood, N.J.

Ball-Bearing SPEED WHEELS

JUVENILE WHEELS (No bearing, solid tires)
4" 40c 6" 65c
5" 45c 7" 75c
(Semi-pneumatic tire, ball bearing)
8 x 1.25... 1.85 10 x 1.25... 2.20
8 x 1.75... 1.95 10 x 1.75... 2.30
8 x 2.00... 2.20 10 x 2.00... 2.65
12 x 1.75... 3.45
INDUSTRIAL WHEELS
Lug Base, Semi-Pneumatic tire
5 x 1.75... 3.65 10 x 2.00... 6.10
6 x 2 SW... 3.45 10 x 2.75... 5.15
6 x 2.00... 4.00 12 x 2.00... 6.90
8 x 2.00... 5.20 12 x 3.00... 9.20
8 x 2.50... 5.40 16 x 4.00... 15.15
Smooth Base, Pneumatic tire and tube
8 x 3.00... 11.00 12 x 4.00... 12.10
10 x 2.75... 6.80 4.00 x 8... 13.10
10 x 3.50... 10.55 14 x 4.50... 13.40

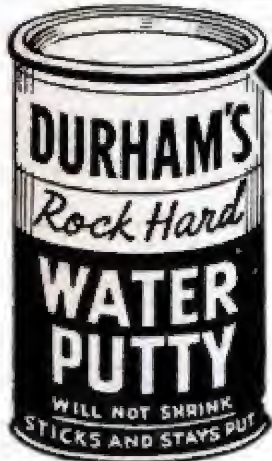
Dealers, Jobbers, and Manufacturers! Our new prices will interest you.
Available Now — CASTERS
Write for circulars on all wheels. Prices F.O.B. our plant.
JIM BROWN TOY COMPANY
1095 HOME AVENUE AKRON 10, OHIO

**It's NEW, BIGGER, Better
The DELTAGRAM...**

• 6 GREAT ISSUES Only \$1.00 •

SEND FOR FREE "Get Acquainted" Copy

For only a dollar you get a whole year of Deltagrams—over 100 shop-tested plans, scores of fine projects and many valuable tips on home repairs and care of fine tools. Delta spent months and thousands of dollars to find out what you homemaker want in a magazine—and the new Deltagram is the answer to your demand: 6 wonderful issues each year—truly a treasure house of fun and profit. *Send \$1.00 today for your 1 year subscription! Or, if you prefer, first write for a free "sample" copy.* Delta Power Tool Division, Rockwell Manufacturing Co., 803E E. Vienna Ave., Milwaukee 1, Wisconsin.



**The Modern PLASTIC
for lasting Home Repairs**

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. If unobtainable from your lumber, paint or hardware dealer, the big 4-lb. can will be sent you post-paid (in U.S.) for only \$1.25. Full money-back guarantee, order now.

DONALD DURHAM CO.
Box 804-Q, Des Moines, Iowa

COLD CHEMICAL

BLUED FINISH

Professional—Instant Results

For hand made tools, metal workshop projects, cast iron and steel articles, including guns and fishing gear. Especially good for all marine use.

*Ideal rust resistant blued finish.
Anyone can use it—never fails.*

Sure Shot INSTANT GUN BLUE

BAYPORT CHEMICAL CO. DEPT. P
Linden Hills Station MINNEAPOLIS 10, MINNESOTA **\$1** 2 Fl. oz.

BATTERIES!—START

—a factory at home and re-cast junk batteries into new; latest achievement. We supply complete instructions and everything needed. Large daily profits!

BATTERY LABORATORIES, Dept. PM, Minneapolis 4, Minn.



SAY YOU SAW IT IN POPULAR MECHANICS

WAR SURPLUS BARGAINS

**\$500,000.00 INVENTORY
for QUICK LIQUIDATION**

Surplus items—hundreds of them for home, shop, factory, farm and outdoor use. New items, used items, reconditioned items—all at tremendous savings—all priced for quick sale.

Page After Page of Values

This big catalog shows page after page of amazing money saving values. Write for your copy today. Send 10c to cover postage, mailing, etc. Write today!

SEND TODAY FOR YOUR COPY

10c

STARK'S

Dept. PME 509 So. STATE STREET CHICAGO 5, ILLINOIS



**EXTRA BLADE
Bonus Special \$1.00**

With every PTI blade you buy at the regular price ... you get an extra blade for only \$1 more. Ask your dealer.

PTI



**The ORIGINAL Safety Saw Blade
tested and approved by the
World's leading Laboratories**

For a dependable safety saw blade that eliminates "kick-backs" from circular sawing—insist on the genuine PTI blade. (U. S. Pat. No. 2,559,355).

Precision made of chrome vanadium steel by one of the world's leading saw blade manufacturers. Cuts cleaner, quieter, smoother—and requires 30% less power. Available in sizes from 7" to 16" and for standard makes of portable saws.



Write for circular giving full details.

Incorporated, 401 Broadway, New York 13

Preston PTI Sales and Service, Preston, Ontario, Canada

Build your own SMITH Compressor

Operates spray guns, rock drills, tampers, paving breakers, sandblasting . . . Uses only 1 gallon of gas an hour!



Save Money—build your own Smith Air Compressor! Famous the world over! Capacity 60 cu. ft.; pressure up to 100 lbs. per sq. inch. Just order the Smith Compressor Head and Accessories with complete instructions for assembling. All you need is a Ford Motor and shop facilities. Head equipped with high speed compressor valves; automatic unloading and idling.

Write for complete information!

GORDON SMITH & COMPANY, Inc.
410 College Street • Bowling Green, Ky.

SURPRISE YOUR WIFE

WITH A
LONG LASTING
CLOTHESLINE



NEVER-STAIN

ALUMINUM CLOTHESLINE

SOLID OR
STRANDED

- ★ Won't Rot, Rust or Crack
- ★ Once Up — Always Up
- ★ For Yards, Basements, Attics
- ★ Holds All Types of Clothespins
- ★ Won't Soil Washing

Ideal for many uses in your Home and Work-
shop. Available in 50 to 300 ft. lengths.

NICHOLS WIRE & ALUMINUM CO.
DAVENPORT, IOWA
World's Largest Manufacturers of Aluminum Nails

Miracle
Walls
by
TYLAC

Beautiful...
**AND SO EASY
TO INSTALL!**



Walls and Ceilings that
Last a Lifetime

Beauty—Permanence—Economy are yours with Miracle Walls by TYLAC . . . the perfect wall panelling! 18 gorgeous colors, 4 modern patterns offer endless combinations to suit your tastes. Easy to install, with our complete installation manual. Large panels go on quickly. Once installed, surface never needs repainting or varnishing. Occasional wiping with damp cloth removes grease and grime, restores original lustre. See TYLAC samples today at your local lumber and building materials dealer.

Write for Beautiful Color Folder — FREE!

MAIL THIS COUPON TODAY!

TYLAC COMPANY
912 Center Street, Monticello, Illinois
Send me your new Color Folder—
free and without obligation.

Name _____
Address _____
City _____ State _____

NEW 1952 KING MIDGET AUTO

World's Lowest Priced 2 Passenger Car. Drive it for 75c per week. Amazing performance. Sur-
prising comfort. All steel construction. Full accessories, top and heat-
er. Ready to run or assemble it with our bolt together parts. Rider
agents wanted, earn your car free. Send 25c for de-
tailed literature or \$1 (re-
funded first order) for ac-
tual assembly book and
service manual filled
with photos, drawings,
specifications,
etc.



MIDGET MOTORS MFG. CO.
ATHENS, OHIO

Build your own JET ENGINE!



SEND
NO
MONEY

Order these plans today

1. JET PROPELLED BICYCLE. Assemble your own. Photo and instructions, \$1.00.
 2. HOW TO MAKE EXPERIMENTAL JET ENGINES. Seven sheets drawings with information and instructions \$2.95.
 3. BOTH OF ABOVE in one order \$3.75.
- SEND NO MONEY. Order both at once \$3.75 C.O.D. in USA plus c.o.d. postage. Send check or Money Order and we pay postage. Get other information too. Rush Order.

J. HOUSTON MAUPIN, Dept. 55, Tipp City, Ohio



CAPE COD CHAIRS
TRELLISES • ARBORS
DUTCH WINDMILLS

Chairs style, B-C-A
PLANS 50c Ea., all 3
only \$1.00. 12 differ-

ent trellis designs PLAN of all 12 only 50c. Authentic 40" high
Dutch Windmill detailed PLAN only 75c. Unique 40" high Light-
house having copper lantern. Ideal for garden or on lake shore of
summer home. Large detailed PLAN 75c.
SPECIAL ALL PLANS ABOVE \$3.00 VALUE ONLY \$2.50
SEND 10c for catalogue of many fine projects.
Dept. P40
CRAFTSMAN'S MODEL CO., DELAFIELD, WISCONSIN

SET-UP - KNOCKDOWN SAWHORSE with *Jiffy* BRACKETS



No nails or bolts... use 2x4's for legs.
2x4 or wider for crossbar. Rugged,
sturdy, easy to move, saves storage
space. Sold by hardware and build-
ing material dealers, or order direct.

GRAND HAVEN STAMPED PRODUCTS CO., Grand Haven, Mich.

Model 500 for Home Workshops
or the Master
Crafts-
man



From drill
press to verti-
cal miller in
one minute.
With vise-jaws shown
— \$0.00 extra

Mastercraft ROTARY TABLE

Drills dead straight line or radius —
cuts male, female slides any form—
cuts flats, hex, squares, keyways, spe-
cial shapes, splines, other forms. AD-
JUSTABLE DIALS read in thousandths
— ROTARY TABLE graduated in 360
degrees; is 7" square, travels 4 1/2"
either direction—QUICK ACTING Swiv-
el Vise jaws positively lock regular or ir-
regular shapes up to 4 1/4". ADAPTABLE
TO ANY DRILL PRESS. \$35.00.

Prices F.O.B. Hollywood, California.
No Die-castings used. Write for descriptive
literature for larger models.
**F&M SALES, INCORPORATED 1054 CAHUENGA BOULEVARD
HOLLYWOOD 38, CALIFORNIA**

NEW! NON-FOULING SPARK PLUG for

AUTOMOBILES • TRACTORS • TRUCKS
LIGHTING PLANTS • POWER MOWERS
MARINE ENGINES • OUTBOARDS

95c

each in
sets of
6 to 8!

Amazing New CIRC-O-FIRE "360"

Lasts Longer! Fires in a Circle!
Permanent Gap! Self-Clean-
ing! Improves in Use!

SEND FOR YOUR SET NOW!
Include Make-Model-Year-
Number Cylinders

SEND NO MONEY-PAY C.O.D.

Write for
FREE
Literature!

2413 DENTON AVE.
CIRC-O-FIRE SPARK PLUG CO., DETROIT 12, MICH.

SURPLUS MACHINE SHOP TOOLS AT PRICES YOU CAN AFFORD

SET 7A 12 Different Size H. S. Straight Shank Drills, $1/8"$ to $1/2"$, lengths up to 7". PPD. Only. **\$3.98**

HIGH SPEED MORSE TAPER SHANK DRILLS



SET 9A 15 Different Size High Speed Morse Taper Shank Drills up to $9/16"$ with No. 1 and 2 tapers. New and used. $\$50$ value. Priced at only. **\$6.49**

SET 10A 20 Different Size High Speed Morse Taper Shank Drills from $1/8"$ to $1"$. New and used. $\$70$ value. Priced at only. **\$12.95**

SET 15A 10 Different Size High Speed Morse Taper Shank Drills from $1/8"$ to $1/2"$. New and used. $\$50$ value. Priced at only. **\$9.95**

SET 37A 8 Different Size High Speed Morse Taper Shank Drills from $1"$ to $2"$ with No. 3, 4, and 5 tapers. New and used. $\$125$ value. Priced only. **\$29.95**

HIGH SPEED WOODRUFF KEY-SEAT CUTTER

SET 4A 5 different size cutters. Can be used as mounted milling cutter or circular saw. All with $3/8"$ and $1/2"$ shanks, widths up to $1/2"$, dia. up to $1"$. New and used. PPD. Priced at only. **\$3.95**



Money Back Guarantee—All Mds. Mixture of New and Reconditioned Unless Specified New. ALL ITEMS (EXCEPT THOSE SPECIFIED POST PAID) WILL BE SHIPPED F.O.B. TULSA—OR ADD 10% AND WE WILL SHIP YOUR MDSE. PPD. Write For Free Catalog Describing Thousands of Bargain Cutting Tools.

Bargain Tool & Shop Mixes!—PPD.

HOSE CLAMP MIX: 50 Assorted. New clamps up to $1 3/4"$. **\$1.98**

MILLING CUTTER MIX: Assortment of 4 various size H. S. milling cutters, all with $1"$ arbors; up to $3"$ dia. only. **\$3.98**

NEW ROTARY FILE MIX: 7 different size H. S. files, $1/8"$ shanks. New cost as high as $\$2.00$ ea. Only. **\$4.49**

FILE MIX — BRAND NEW: Set of 12 different files, lengths 6, 8, 10, 12 in. Half rounds, bastards, knife, mills, etc. First line Nichols, Helder and other brands. **\$3.49**

GRINDING WHEEL MIX: 30 grinding wheels with $1/4"$ arbors, up to $3"$ in dia., plus mandrel, only. **\$3.29**

TAP MIX: 8 different size H. S. standard thread Hand Taps up to $3/4"$, including 3 std. H.S. pipe taps. PPD. **\$2.95**

MIDGET REAMER MIX: 12 H. S. straight shank reamers, $3/16"$ down, majority new. Just the thing for the instrument man, jeweler, etc. **\$2.98**

DOUBLE END END MILL MIX: 4 right hand twist H. S. $3/8"$ shank End Mills up to $3/8"$ dia. **\$3.98**

NEW 360° SWIVEL TYPE TOOL HOLDER AND BORING BAR

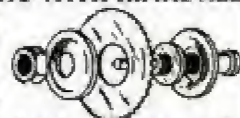
Here is a tool that will do the work of a left, right and straight tool holder, plus a boring bar, all for a fraction of its original cost.

TOOL A takes a $5/16"$ sq. bit or $5/16"$ dia. boring tool, Shank size $9/16" \times 1" \times 4 3/4"$. PPD. Only. **\$3.29**

TOOL B takes a $1/4"$ sq. bit or $3/8"$ dia. boring tool. Shank size $5/8" \times 1-3/16" \times 5 3/4"$. PPD. Only. **\$3.95**

6 SLITTING SAWS WITH MANDREL

SET 34A 6 Different Size High Speed Slitting Saws, $2 3/4"$ dia. x $1"$ arbor. Thickness from .040 to .071. Cuts wood, aluminum, brass, steel, etc. PLUS SPECIAL MANDREL which enables use of saws in $1/2"$ or $3/8"$ elec. drill. $\$25$ Value. PPD. Only. **\$4.95**



7 selected, sharp H. S. Slitting Saws as above to use on your own mandrel or milling machine. New and used. PPD. A bargain at. **\$4.95**

H. S. TAPER SHANK CHUCKING REAMERS

SET 25A 15 Different Size High Speed Morse Taper Shank Chucking Reamers up to $1/2"$ with No. 1 and 2 tapers. New and used. Priced at only. **\$7.95**

SET 13A 8 Different Size High Speed Morse Taper Shank Chucking Reamers from $1/8"$ to $1"$. New and used. Priced at only. **\$6.95**

SET 12A 10 Different Size High Speed Morse Taper Shank Chucking Reamers from $1/2"$ to $1 1/2"$. New and used. $\$65.00$ Value. Priced at only. **\$12.95**

NEW HIGH SPEED COMBINATION DRILL AND COUNTERSINKS

SET 2A 8 selected sizes from $A1$ to $F2$ ($3/64"$ drill x $1/4"$ body to $3/16"$ drill x $7/16"$ body) 60° angle of countersink. New cost on these countersinks $75c$ to $\$2.50$ ea. Priced to you Ppd. at only. **\$3.98**

T & T TOOL 221 W. SECOND TULSA, OKLA.

BOYS-IT'S FREE!

"THE WONDERS OF CHEMISTRY"

This exciting new book shows how to amaze your friends with chemical magic. Describes many fascinating home experiments, tells of fun, thrills and big future opportunities for boys who know chemistry. Special atomic energy feature. Send today!

THE PORTER CHEMICAL COMPANY
135 Prospect Avenue, Hagerstown, Maryland



PITH HELMET

Genuine British Army pith helmet. Coolest, most comfortable, most practical sun helmet made. Best possible sun protection for hunters, fishermen, prospectors, mountain climbers, beachgoers. Ideal for engineers, construction workers, farmers, anyone that's outside. Perfect ventilation for cool comfort. Proven effective by the British army in Africa. Khaki covered pith cork, foil lined, leather sweatband. The perfect all-terrain headgear. Sizes: $6 1/2"$ - $7 1/4"$. $\$12.50$ Value. (Add 35c for Postage and Handling) **\$3.95**



GIANT BALLOONS

Neoprene; Surplus Govt. Weather and Target Balloons. Terrific attention getters for Lodges, Civic Events, School Functions, Conventions, Exhibitions, Trade Shows. Advertise your special events in the Hollywood manner. Make any occasion a success. Great back-yard fun. Marvelous for parties, dances, fairs, picnics, all festivities.



3 Ft. Dia. 39c; 6 Ft. Dia. 79c; 13 Ft. Dia. $\$1.39$
Add 10% for Postage and Handling. Calif. Res. add Sales Tax.

SWIM GOGGLES

Large Glass Lens. Exclusive inner vacuum lip molds to fit face. Adjustable head strap. Explore under water with comfort. Natural rubber. Sea green. For pool, ocean, lake or river. **\$1.25**

JR. GOGGLES — plastic lens **79c**

6 BASE ROSE SMOKE SUNGLASSES

Genuine U. S. A. F. style quality sunglasses, ground and polished for perfection. Soothing protection against eye-strain and harmful glare. Unconditional guarantee. Includes Air Force case. A regular $\$12.50$ value. **\$3.95**

Add 10% for postage and handling. CALIF. RES. add Sales Tax

WAR ASSETS DIV. VOLUME SALES CO.

Dept. M-5-52, 3930 Sunset Blvd., Los Angeles 29, Calif.

SAY YOU SAW IT IN POPULAR MECHANICS

SAWING IS EASY!

WITH THE **SPEED-SAW** OF 1000 USES FAST AND ACCURATE

FEDCO

MADE IN U.S.A.
Saw-Rite
MODEL 605

the ONLY Saw with a ONE YEAR Gear GUARANTEE

AT ONLY \$10.95

plus your own $1/4"$ drill and you have the Speediest Little Power Saw for wood, plastic, beaverboard, wallboard, etc. FULLY ADJUSTABLE . . . any DEPTH from $1/8"$ to $1 1/2"$ inches . . . any BEVEL angle from 0 to 45 degrees . . . has accurate RIP-GAGE edge guide.

CUTS CLEAN and TRUE * RIP or CROSS * DADOES and GROOVES EASY ONE HAND OPERATION LEAVES A FINISHED PROFESSIONAL LOOKING JOB.

An Indispensable Workshop Tool . . . Does a Man's Size Job, yet small enough to fit a Tool Box.

Smooth, high-torque mitre-drive, quick-acting and free of back-lash . . . chrome nickel steel, dynamically balanced blade . . . one-piece aluminum housing . . . Oilite bearings . . . hardened shafts . . . copper-steel gears . . . EXCLUSIVE quick-clamp connecting yoke . . . clear-view visible cutting guide . . . AND every other Feature for Comfort, Safety and Ease of Operation.

DEALERS: WRITE FOR NEAREST JOBBERS.

FEDERAL ENGINEERING CO. **M 52** 37 Murray St., N.Y. 7, N.Y.

Buy the Best...WISS!



for all sheet
metal cutting

WISS Metal Master Compound Action Snips

#M-3. Easily cuts 18 gauge sheet metal. Cuts curves and circles as well as straight. Ideal for the home workshop. \$4.25. Rubber grips recommended, 60¢ extra.

WISS Straight Cut Snips

#9. Crucible steel inlaid blades. The basic snips for straight metal cutting. Gun metal handles. Overall length 12½". \$5.25.

WISS Combination Snips

#V-13. Solid steel, with gray japanned handles. Cuts curves and irregular shapes with ease. Handy pocket size, 7" long. Accurately tempered jaws and strong bolts. \$1.85.



Prices slightly higher
Denver and West



Quality for more than a Century

J. WISS & SONS CO. • NEWARK 7, N. J.

The easy way to paint!

Speedy Sprayer

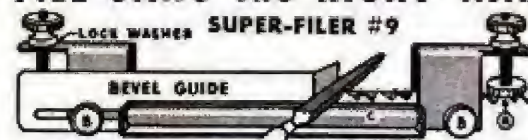
ONLY \$32.50 LESS MOTOR

Favorite of home owners and craftsmen for 20 years! SPEEDY SPRAYER gives your work that professional paint finish everyone admires. Sprays paint, enamel, varnish, lacquer, etc. . . . 4 to 7 times faster than hand brushing! Lightweight, portable, uses any ¼ H.P. motor. Improved diaphragm principle assures clean, oil-free air. You'll find dozens of time and money saving uses for SPEEDY SPRAYER, including spraying insecticides 2-4-D and DDT. Complete outfit, without motor, only \$32.50.

At leading hardware, lumber, and auto supply dealers. FREE—write for handy booklet "How to Spray."

W. R. BROWN CORPORATION
2635 N. Normandy • Chicago 35, Ill.

FILE SAWS the RIGHT WAY



USED AS
JOINTER

SO EASY with this new filing jig and jointer anyone can now sharpen any handsaw like new! When file hits hardened steel rollers teeth are finished and EXACTLY THE SAME HEIGHT. All teeth cut and saw runs true and smooth. Jig and instructions \$2.95 postpaid. FREE FOLDER.

SHARPEN YOUR CIRCULAR SAWS

The RIGHT WAY on your own saw table. Sharpens rip, cutoff, hollow ground and combination blades—6" to 10". Saws stay round with correct bevel. Easy to use, GUARANTEED. TRU-CIRCLE JIG #7 \$6.95. Includes \$3.00 Grinding wheel.

"TRU-CIRCLE" saw set automatically sets teeth at 10° or more. \$2.95

AT DEALERS OR POSTPAID

A. D. McBurney, 317 E. 4th St., Los Angeles 14, Cal., Dept. A-17

NEW SMALL PARTS CABINET

WATERLOO METAL BOXES AND CHESTS

Metal bound. Baked green enamel. Green plastic drawers. Removable dividers. At hardware stores. Write for free catalog—complete Waterloo line of metal boxes and cabinets. Waterloo Valve Spring Co., Waterloo, Ia.

BUILD INDIAN BARBECUE PIT

Cook outdoors the Wisconsin Indian way in your back yard. Easy to build of field stone and sod, no bricks or mortar. Authentic, attractive, compact, blends with landscaping. Complete dimensional plans \$1.00. Send to Ye Olde Smoke House—Box 472, Waukesha, Wis.

7" Tilting Arbor Saw

One of Shopmaster's complete line of quality-built tools at the remarkably low price of 47½ Slightly lower some 1

SHOPMASTER, INC.
1214 Third St. S., Minneapolis, Minn.

make your own Gems 29.50 F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing also complete instructions. The complete equipment as shown, less motor and belt, for only \$29.50. f.o.b. Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. S Burlington, Wis.

SPECIAL INTRODUCTORY Offer for FISHERMEN

NEW - SENSATIONAL - AUTOMATIC MARKER BUOY

A Different Gift for Dad and the Boys

Should be in every tackle box. Place in water—line unwinds—automatically stops when weight reaches bottom. Many uses! Marks favorite fishing spot, lost equipment, trolling course, spot where strike occurred. Floats directly over spot. Brilliantly colored—all plastic—unbreakable. Complete with 50 ft. nylon line and stiker. Wonderful gift. Send cash, check or M. O. (NO C.O.D.) Fully Guaranteed.

\$1.00 POST PAID

DEALER AND JOBBER INQUIRIES INVITED
Dept. M
AIR LIGHT PRODUCTS
BOX 649 OMAHA, NEBR.

BE YOUR OWN BOSS!



EARN BIG MONEY MAKING LIFETIME ALUMINUM SCREENS

Here's a full or part-time business you can start on a small investment, in your own garage or workshop, and earn up to 150% profits. No experience needed. We tell you how.

Be the first in your community to manufacture Lifetime Aluminum Screens . . . DEMAND UNLIMITED . . . every home or commercial building, new or old, a prospect, or sell all you make to jobbers.

We furnish all equipment and supplies to make first \$1000 worth of screens, with an investment of less than \$500. J.A. started in garage two years ago, made \$10,000 in 1951.

Write today for complete details on this profit making deal.

B & W ENTERPRISES

3521 SWEETWOOD • HOUSTON 6, TEXAS

DO IT EASIER --- FASTER --- BETTER

with a

SHAW

"DU-ALL"

Walking or Riding Tractor

Plow
Plant
Cultivate
Mow
Rake
Cut Trees
Saw Wood



1½, 2½, 3 and 5 H. P. walking tractors for all large and small gardening. 5, 8 and 12 H. P. riding models that will handle good sized farms. Quality built for 50 years. All wanted tools and attachments.

See the Shaw dealer. Write for **FREE CATALOGS**, low prices on complete Shaw line. Address

SHAW MANUFACTURING CO.
4505 Front St., Galesburg, Kansas
668-G N. 4th St., Columbus, Ohio

GET **BIG FISH**
IN **THE WEEDS!**

JOHNSON'S SILVER MINNOW

A favorite fish-getter that casts like a bullet . . . retrieves through the weeds without snagging. Life-like flash and action.
5 Sizes, 4 finishes.

FREE New Booklet—

"How to Catch Fish—BIG ONES!"

LOUIS JOHNSON CO.
1547-P Deerfield Rd., Highland Park, Ill.



Do 1001 Homecraft Jobs EASIER—FASTER

with

PET TOOLS



HI-POWER COMPLETE ALL-PURPOSE POWER TOOL KIT

Features Hi-Power ¼" Electric Drill for use as a portable tool, and the easy handling PET Drill-Saw with 4" blade that takes the work out of cross-cutting and ripping boards up to 1". Also includes Horizontal Stand and bits, plus accessories for sanding, polishing, and mixing. This 22-piece Hi-Power Kit, Model 77-16, is a real thrill for anyone who likes to build or repair things around home, farm, shop. Complete with sturdy metal carrying case—only **\$26.60**



Model 510
½" drill—
\$38.75

ZEPHYR ELECTRIC DRILLS—lightweight, modern streamline designs. Precision dynamically balanced, smooth running, AC-DC motors.



Model 1950-H
¼" drill—**\$18.95**

ZEPHYR 625-L ELECTRIC HAND SAW

Balanced, lightweight design for easy handling in any position. 6½" blade. Depth of cut 2¼". Adjustable for depth and angle. Includes graduated ripping guide. AC-DC motor. Price **\$47.50**



Write for name of nearest dealer and catalog on complete line of PET Tools

PORTABLE ELECTRIC TOOLS, INC.

324 West 83rd Street, Chicago 20, Illinois
In Canada, Portable Electric Tools, Ltd.
369 Danforth Rd., Toronto 13, Ontario

TAKE LESS THAN 1 MINUTE TO

Keep Paint Brushes
Like **NEW!**

Store Them Dry,
They Stay Soft
and Flexible
**READY FOR
INSTANT USE!**

PROCESS 33

INSTANT PAINT BRUSH CLEANER

- Quickly cleans fresh paint from a paint brush or roller.
- You can paint instantly with another color—or store brush dry—it will stay soft.
- Economical—can be used again and again.
- Safe for all brushes and rollers.

Pint 59¢ Quart 98¢ Gallon \$3.25

Wherever Paint is Sold

best
white tape
made

ONLY
98¢



The new "Evans White-Tape" has everything you'll find in tapes costing over \$1.50—plus.

- snow-white blade with bold, legible, jet-black numerals and graduations. Graduated in 32nds for first 6 inches.
- sturdy die-cast case heavily chrome-plated, calibrated for quick reading inside and outside measurements.
- blade 1/2" wide made of finest high carbon steel—tempered—Bonderized—enamelled—baked.
- blade replaceable in seconds—without tools—without even opening case. And Evans replacement blades cost far less.
- every "Evans White-Tape" is unconditionally guaranteed.
- exclusive Evans automatic brake gives smoother push-pull action with absolutely no "creeping" of tape into case.
- underside is white, too. Mark with ordinary pencil, remove mark with flick of thumb.
- unheard-of low price*: 10-ft. \$1.49; 8-ft. \$1.19; 6-ft. 98¢. Prices higher in far west and Canada.

Evans

Sold only through retailers.

& CO. • Elizabeth, N.J. • Montreal, Que. • 700

Wholesale Evans 3311, Franklin Hill, and Franklin Road

DYNAMIC POWER TOOL COMBINATION



INCLUDES: Cummins 1/4" Electric Drill; Cummins Saw Attachment; Combination Saw Blade; Set of Drills; Lamb's Wool Bonnet; 6 Sanding Disks; Steel Arbor and Attachments; Cloth Buffing Wheels; Grinding Wheel; Wire Wheel Brush; Steel Paint Mixer; Steel Bench Stand; Portable Steel Carrying Case.

Price of Dynamic Power Tool Combination complete is \$26.95

**SHIPPED ON APPROVAL
NO MONEY WITH ORDER—NO C. O. D.**

Try it ten days before you buy. If completely satisfied then send \$2.95 and pay balance at rate of \$4.00 per month for 6 months—**No Interest or Carrying Charges Added.** If not completely satisfied, return to us, no explanation necessary.

KAPNER HARDWARE, INC.

Dept. A-33, 2248 Second Ave., N. Y. 29, N. Y.

PUMP WATER FAST!

DRAIN WASH TUBS, CELLARS, CISTERNS
IRRIGATE—FILL TANKS—DRAW WELL WATER

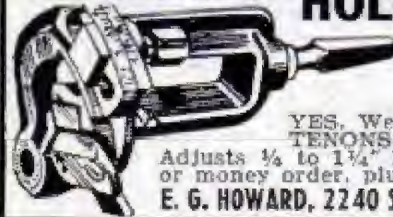
Pumps 2800 GPH. 420 GPH at 75' High or 1600 GPH from 25' well. Sturdy, Rustproof Alloy Metal. Six Blade Impeller. Uses any 1/8 to 1/2 H. P. Motor. Will not leak or clog. Fits any garden hose. Immediate Money Back Guarantee. Send Check, M.O., or C.O.D.

895
IN
U.S.

MOORE MANUFACTURING CO.
SWEDSBORO—1—NEW JERSEY

ADJUSTABLE

HOLLOW AUGER



USUAL \$7 VALUE
\$2.00

YES. We said \$7 VALUE! CUTS TENONS or WHEEL SPOKES. Adjusts 1/4 to 1 1/4" Diam. Send cash, check or money order, plus 35c for mailing to E. G. HOWARD, 2240 S.W. 19th Terr., Miami, Fla.



WHEELS

JUVENILE,
INDUSTRIAL,
AGRICULTURAL

Write for Literature and Price List.

CIRCLE METAL MFG. CO.

4266 E. Pacific Way, Los Angeles 23, Calif.



G E A R S

In Stock - Immediate Delivery

Gears, speed reducers, sprockets, thrust bearings, flexible couplings, pulleys, etc. A complete line is carried in our Chicago stock. Can also quote on special gears of any kind. Send us your blueprints and inquiries.

Send for Complete Catalog No. 10

CHICAGO GEAR WORKS

440-50 N. Oakley Blvd., CHICAGO 12, ILL.

NOW—40 different CUTS with

AMAZING, NEW

Warren

DADO SAWING WASHERS

On Your Saw Blade

Just dial widths to cut parallel grooves perfectly smooth. No warp, vibration



or trick screws. Strengthens blade, perfect balance. **GUARANTEED!** At your dealer's or order direct. Give arbor size—1/2", 3/8", 3/4", 1".

Send for free booklet

WARREN WASHERS COMPANY

Dept. 25, Box 98 North End Station, Detroit, Mich.

ONLY

\$4.95
PER
SET

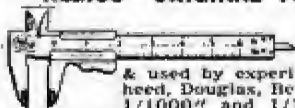
AIRBORNE SALES ♦ WAR SURPLUS AND OTHER BARGAINS ♦ SAVE UP TO 90%

AIRCRAFT NAVIGATIONAL DRAFTING MACHINE



Designed for plotting navigation problems and adaptable to surveying layouts & general drafting room use. Limited quantity purchased from U. S. Navy (AN5730). Mfd. by Bruning Wallace. Non-magnetic, double-sealed type ball bearings of Beryllium copper require no attention. Non-magnetic K-Monel bands are not subject to corrosion. ALL NEW. Complete with fitted hardwood case incl. spare parts. WL 11 lbs. Approx. Govt. Cost \$150. **WHILE THEY LAST! ALL yours for just \$47.50.**

"HELIOS" ORIGINAL TOOLMAKERS VERNIER CALIPERS



ULTRA PRECISION — Imported for the really critical mechanic who must have the best. Recommended & used by experimental & research machinists at Lockheed, Douglas, Bendix, GM, RCA, GE. ALL NEW. All with 1/1000" and 1/128" verniers... decimal equivalents in 8th, 32nd and 64th... graduation divisions engraved... extra heavy rule, hand-fitted sliding head, no side play... Rockwell C. 60 lapped measuring surfaces... Micfilm carrying case.

No. 50E—inside, outside & depth measurements, length of graduation 6", handy thumb-operated slide lock, a \$37.50 value—**SAVE 60%—only \$12.95.**

No. 65—inside & outside measurements, with points, measuring range 8", a \$47.50 value for just **\$14.95.**

No. 65B—with 12" measuring range for **\$16.95.**

German-made Mauser Design Caliper for the production machinist, 0-8" in thousandths, just **\$10.95** incl. leather case. Unbelievably low prices due to lower import duty. Money back guaranteed!

LOW VOLTAGE CIRCUIT TESTER



Made for U. S. Ordnance Dept. to rigid specification. Portable steel hand-carrying unit is a self-contained trouble shooting device for making a complete & rapid check of the generator battery circuit, incl. any circuit & voltage regulators. Battery voltage, regulators, cut-out settings and generator performance easily determined. Terrific testing unit for garages, mechanics, truck fleet owners, boat and marine mechanics. Can be used on any 6 or 12 volt system. Approx. Govt. cost \$175. NEW, complete with instruction book, only **\$32.50.** Shpg. wt. 20 lbs.

ALL NEW HIGH SPEED DRILLS

Fractional & numbered. Nationally known brand. Set of 30, assorted sizes, an \$18 value for only **\$3.50** complete.

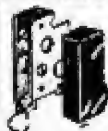
STRAIGHT SHANK DRILLS — 10 different sizes High Speed Straight Shank Jobber length drills, 1/4" to 1 1/2" (shank same diameter as drills). Here's a \$25 value you can have for **\$3.50.**

WIRE GAUGE DRILLS — From 45 to 60. Highest quality steel. You'll recognize the brand. Hard to get sizes valued at \$7.50. Airborne gives you a set of 12 for an even **\$2.00.** Set from 1/4" to 33/64". Five sizes with 1/4" shanks. You'll surely want this set for the low, low price of **\$3.00.**

10 LBS. ASSORTED MIX



A must for the hobbyist, machine shop or farm. Aircraft quality assorted nuts, bolts and washers. ALL NEW. Approx. value \$20, so how can you possibly go wrong at the Airborne price of **\$2.75.**



MICROSWITCH

Type Z-2" x 1". Used open or closed. For automatic contacting... light, sound, model train systems, chimes, etc. NEW! 5 for \$2. Aluminum Spring Actuator to fit above Microswitch.-----5 for \$2.



RIVET SETS

Universal type, case hardened tips. Set of dies will head up only brazier or round head rivet from 1/8" to 1/4". With adapters for air gun or hand use. All new—cost Govt. approx. \$27.00. Complete 12 piece set (wt. 2 lbs.)—**\$5.00**

IMPORTED "HELIOS" DEPTH GAUGE

Narrow measuring stock. 1/1000" & 1/128" Verniers. Graduation divisions engraved. Measuring range 6", length of jaws 4" (a \$27.50 value) for **\$9.50.** Measuring range 8", length of jaws 1 1/8" (a \$32.50 value) for **\$10.50.** Measuring range 12", length of jaws 3 3/8" (a \$39.50 value) for **\$12.50.** ALL NEW. All with money back guarantee.

MICROMETERS



Chrome plated, precision engineered. Carefully tooling to give long life. All new 0.1" capacity—**\$2.25** ea 1.2" capacity—**\$3.50.**

CAMPER'S special—4 BRIAR PIPES, \$1

Sharp looking, brand new, genuine briar pipes. These beauties Approx. Govt. price \$2.50 to \$3 apiece. Complete set of 4 only **\$1**... **WHILE THEY LAST!**

NEW, BIG 1952 CATALOG BARGAINS FOR EVERYONE • SEND 25c FOR YOUR COPY TODAY! ORDER from ad NOW!
Check, Money Order or Cash. 25% deposit on C.O.D. orders. Prices F.O.B. Culver City, Calif., unless otherwise stated.

AIRBORNE SALES CO., INC., DEPT. PM 552, 8501 STELLAR DR., CULVER CITY, CALIF. • SAVE \$\$\$

New SPARK PLUG TESTER

TEST your OWN PLUGS!

- Save time—money
- Convenient—easy to carry, only 5" long
- Mechanical pencil on one end



ONLY \$1.50 P.P.

Made on New Ultra-High Frequency principle. Forms miniature radio receiver. A reliable indicating device, will only respond to performance of Spark Plug inside Motor. Reveals whether Plug is sooted—greasy or short-circuited. Easily, Quickly and Safely Check before replacing plugs.

WESCO SALES 5864 Hollywood Boulevard Dept. PM 5, Hollywood 28, Calif.

IS \$210.00 A WEEK Worth a Post Card to You?

Then rush post card with name and address. Get FREE details of amazing full- and spare-time PROFITS made by ambitious men handling new Automatic Defroster for refrigerators on FREE TRIAL basis. Learn how the housewives hand you BIG PROFITS when you just plug in the D-Frost-O-Matic to end defrosting mess, forever. Send post card for SPECIAL OFFER TODAY!

D-FROST-O-MATIC

173 W. Madison St., Dept. H-6, Chicago 2, Ill.

TRY MONTA MOWER

on Your Own Lawn

on Approval

8 1/4 LBS.



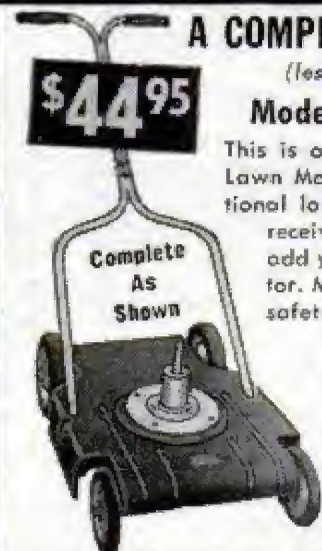
TRIMS AS IT MOWS IN ONE EASY OPERATION

Save time and labor! So sure are we that you will find the versatile Montamower an amazing work and time saver that we offer it on approval for an extended trial period. Its live, precision mechanism first gathers then smoothly cuts a clean 16" swath through grass, dandelions, spike grass and tall lawn weeds. Almost noiseless. As modern and efficient as your electric razor. Cuts right up to walls, fences, trees and under overhanging shrubs... practically eliminates hand trimming! Cutting height adjustable. Cuts steep banks easily! Cutters are self-sharpening. Drive shaft mounted on free rolling, permanently lubricated and factory sealed bearings. Hundreds of thousands in use. Buy direct from factory and save. Write today for full details on limited "Special Price... Extended Trial Offer".

MONTAMOWER DISTRIBUTING CO.

P.M. 25 KEELER BLDG. • GRAND RAPIDS 2, MICH.

ATLAS Rotary Type POWER KEEN-MOWER



A COMPLETE POWER MOWER

(less elec. motor or engine)

\$44.95

Model 50M as illustrated

This is one of America's finest Power Lawn Mowers . . . offered at the sensational low price of \$44.95. When you receive mower all you need do is add your gas engine or electric motor. Mower has concealed blade for safety, 3 cutting heights, 1 1/2" to 3 1/2". Ball bearing rubber tired wheels. 18" cut and cuts to within 1/2" of sidewalk. Weighs only 48 lbs. Shipped FOB, Kansas City. Send check or money order . . . **\$44.95 ONLY**.....

Make Your Own POWER LAWN MOWER

with this DRIVE CUTTER ASSEMBLY. Constructed for those who desire to build their own mower or to replace your old cutter assembly. Complete with 18" blade and double ball bearing drive, only . . . **\$12.95** Add 50c to cover handling and shipping. Send check or M.O.



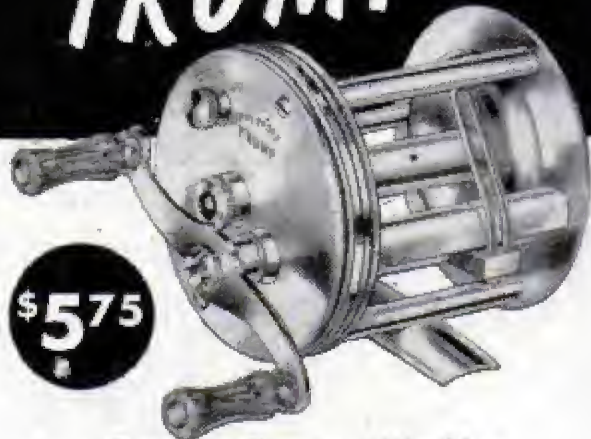
ATLAS KEEN MOWER

229 S.W. BLVD.

Dept PM5

KANSAS CITY, MO.

PFLUEGER TRUMP REEL



\$5.75

Casts Beautifully

You'll be surprised at how well the Pfluegers make this smart looking reel. Its dependable gears and level-wind mechanism work smoothly—its anti-back lash has graduated tension to assure positive action. Its extra heavy chromium of finest quality resists corrosion. Here's the ideal reel as an extra in your tackle box or for regular fishing. Ask your dealer.

THE ENTERPRISE MFG. CO., AKRON, OHIO
88 years making fishing tackle
Everything for fresh or salt water fishing

PFLUEGER
(Pronounced FLEW-GER)
A GREAT NAME IN TACKLE

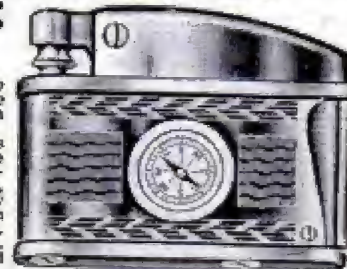
New! . . . TERRIFIC! DOUBLE PURPOSE! COMPLETE LIGHTER-COMPASS ALL IN ONE!

Ideal for: Campers, Fishermen, Hunters, Motorists, Vacationists

FULLY AUTOMATIC

A \$10.00 Value! **1.98**

Just out! Be among the first to own one. The lighter is Chrome Plated, precision made, beautifully styled, thin as a watch. The compass is the "real thing". It is genuine, accurate, and good for a life-time. Case is richly engraved, of modern design throughout. Lighter has two fuel chambers for double lighting duration. Its dependable safety-action produces instantaneous light with easy finger-tip pressure. Fits snugly into any pocket or purse. A most ideal gift for anyone. Surprise Dad on Father's Day. Get one for yourself, another for a friend. A super \$10.00 value. Fully Guaranteed. Rush your order now! Send remittance with order, we pay Postage.



UNIVERSAL IMPORTERS, Dept. PM, 1841 W. Madison St., Chicago 12, Ill.

quick on LITE-GARD

PROTECT THE I-ZONE + Stops Sun and Headlight Glare.



\$1.50
Post Paid

Send check or money order.

Green plastic-like strips (in adhesive solution). Easily applied. Gives safe, clear visibility. Permanent protection.

EDCO SALES CO. 19953 Jas. Cousins Hwy. Detroit 35, Mich.

DUST-O-VAC

FOR HOME WORKSHOP & INDUSTRY
FOR ALL MACHINES — Collects & Bags Wood & Plastic Chips, Wood & Metal Dust, Wood Shavings. 110 AC. DC. SEND FOR FREE LITERATURE.

HEAVY CAST ALUMINUM BLOWER — ONLY \$11.25
For workshop, lab., kitchen, cellar, app. 100 CFM. Send for circular.

UNIVERSAL YONKERS CORP., 137 ALEXANDER ST., M-5, YONKERS 2, N. Y.

Beautiful Effects—CABOT'S STAIN WAX

NEW BLOND SHADES . . .
Glacier Blue
Seashore
Gray
Ivory, White
Natural

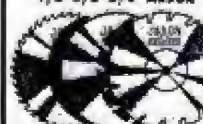
Stains and waxes in one application. Ideal for home projects, cabinets, unfinished furniture. Easy to apply, easy to clean.

Write today for color card.
Samuel Cabot, Inc., 562 Oliver Bldg., Boston 9, Mass.

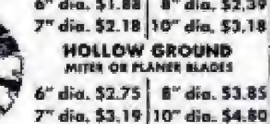
Say You Saw It in Popular Mechanics

QUALITY AT LOW COST SHOP ACCESSORIES FULLY GUARANTEED

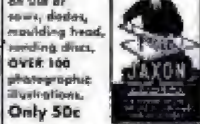
Saw Blades
CHROME • NICKEL • MOLY STEEL
1/2-5/8-3/4" ARBOR



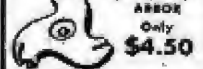
FLAT GROUND
RIP • CROSSCUT • REGULAR
OR NOVELTY COMBINATION
6" dia. \$1.88 8" dia. \$2.39
7" dia. \$2.18 10" dia. \$3.18



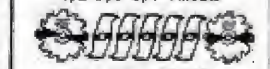
You'll Want This Book
SEND FOR IT TODAY!
32 PAGES
on use of
saws, dodges,
moulding heads,
moulding discs,
OVER 100
photographic
illustrations.
Only 50c



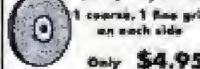
SHAPER HEADS
FOR YOUR TABLE SAW
1/2-5/8-3/4" ARBOR
Only \$4.50



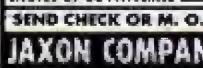
6" IN. DADO HEADS
CHROME • NICKEL • MOLY STEEL
1/2-5/8-3/4" ARBOR



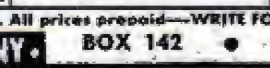
8 IN. SANDING DISCS
FOR YOUR TABLE SAW
1/2-5/8-3/4" ARB.
1 coarse, 1 fine grit
on each side
Only \$4.95



MOULDING CUTTERS
only \$3.85 per set
CHOICE OF 28 PATTERNS



Cuts 1/4 to 1 3/16"
in steps of 1/16"
2 Hollow Ground Blades
3 Inside Chippers
Only \$9.95



EXTRA SANDPAPER
5 grit 80c
SANDING DISC
CEMENT only 40c



SEND CHECK OR M. O. All prices prepaid—WRITE FOR FREE CATALOG P-5
JAXON COMPANY • BOX 142 • GASPORT, N.Y.

GIGANTIC CLEARANCE MAIL SALE

WAR SURPLUS EXCESS INVENTORY BANKRUPT STOCK



TREMENDOUS INVENTORY SALE • WE PAY SHIPPING CHARGES

AIR COMPRESSOR UNITS

Paint, blow up tires, control terminals, use in shop, etc. Build your own unit.

- **Deluxe Kit.** Build your own. Save 20%. Consists S.S. 12"x 24" (400 lb. test) tank, 1-cyl. piston & c.f.m. compressor, valves, gauge, fittings, hose and excellent paint gun, dust gun, tire chucks, "How-to-Build" instructions. **\$45.90**
- **Quincy Portable Compressor.** 1 1/2-hp., 40-c. 100 lbs. pressure.
- **1-cyl. 2-wheel, with tank, gauge, hose and paint gun, tire chucks, etc.** Ready to use. Special. **\$74.95**
- **Air Components.** Piston compressors (a) 1-cyl. **\$20.50**, (b) 2-cyl. **\$49.50**, Adj. Auto Pressure Switch, 100 to 250 lb., off 75 lb. **\$4.95**, Pres. Regulator, 10 to 250 lb., **\$2.65**. Gauges (60, 100, 160 lb.) **\$1.85**. Pressure cans, 6"x24", **\$5.49**, 12"x24", **\$11.95**. Adj. Safety Valve, **\$1.95**. Air hose with fittings, 25' **\$3.35**, 50 ft. special **\$6.29**. Air blow gun **\$1.21**.

Write for useful Air Data-Catalog

WATER PUMPS and SYSTEMS

Save 60%. Expert advice on problems, wells, irrigation, sprays.

- **Centrifugal Pumps.** Cast iron case, bronze impeller, stainless shaft, ball bc. To 140 g.p.m. Pressures to 30 lb. 3/4", **\$18.90**, 1", **\$28.90**, 1 1/4", **\$35.60**.
- **Rotary Pumps.** Low pressure: (to 25 lbs.) Self priming, Fly-Car impeller, To 20 g.p.m. 1 1/2", **\$12.75**, 2", **\$16.95**, 1", **\$22.95**. High Pressure type: Positive displacement. Pressures to 150 lbs. To 20 g.p.m. 1 1/2", **\$14.50**, 2", **\$20.95**, 1", **\$27.95**.
- **Burdex Shallow Well Water System.** 110-v. 1/2 h.p., 300 g.p.m., 40 lbs. pressure **\$69.50**

Precision Hydro-Jet Pump

• Wonderful surplus value! Brand new standard unit. Designed for orchard, garden, yard, farm, brush and tree (kill) spraying. 30 to 80 lbs. pressure. 1 to 3 gal. per min. Self priming. 25' lift. Can also be used as low pressure (1500 gph) pump. Leading make, Chittin 1.5 h.p. engine, 15' hose, spray jet nozzle. Wt. 65 lbs. List **\$149.50** SALE **\$99.70**



Power Plants and Generators

- **Kato Generators.** 5kw, 115-v. 60-c. **\$259.60**
- **Burdex Generators.** 115-v. 60-c. 1 ph 500-watt, **\$94.50**. 1000-watt, **\$134.90**. 2000-watt **\$150.50**
- **Master Plants.** 5-kw, 115/230-v. 60-c. 1 ph. 4-cyl. water-cooled engine **\$597.90**
- **Onan Plants.** 1-kw, 115-v. 60-c. 1 ph. Full automatic start-stop. Special **\$291.50**

Send for Power Plant and Generator bargain list.

Hi-Intensity Floodlights

- **G. E. Sealed Beam air force long-life extra hi-intensity parabolic precision reflector units.** 24-v. 250-w. 8" size. Equivalent 2500-w ordinary lite. Use 3 in series on 110-v. for 800,000 candle-power illumination effect. Light building fronts, parking lots, ball parks, const. jobs. Original cost, 5 units, **\$39.00**. SALE, 1-unit, **\$4.95**, 5-units, **\$7.49**.



PLANE PROPELLER

- New perfect beautiful laminated polished hardwood brass-tipped-edged air force propellers. 90" long. Wt. 75 lbs. Wonderful den or club decoration. Wind chargers, ice sleds and cars, planes, etc. Govt. cost \$112. Sale **\$12.95**

PHONES — CITY and RURAL

- **Rural Magneto.** Compact oak case. Wt. (a) 3 bar, 1000-ohm, **\$9.95** (b) 4-5 bar, 1000-ohm, **\$13.90**. CITY up-right desk, with bells **\$4.99**. Phone only **\$2.69**

MISCELLANEOUS BARGAINS

- Immersion Heaters, 800-w, 110-v. **\$ 3.98**
- Battery Chargers, G. E. 110-v., Selenium **5.95**
- Tachometer, Direct rd., 0-4000 r.p.m. **\$ 6.79**
- Compass, Air Force, Cost \$59. **\$ 8.95**
- Chain Saw, Electric, 110-v., 8-amp. **\$115.00**
- Chain Saw, Demstrtr. Gas, 4 h.p. **\$289.70**
- Hand Saw, Electric, 6 1/2", 110-v. **\$ 37.40**
- Drill, Electric, 1 1/2" cap, 110-v. **\$ 26.95**
- Drill, Electric, 1/2" cap, 110-v. **\$ 11.76**
- Burglar-Fire Alarm, magnetic unit **\$ 1.49**
- Hydraulic Cyl, 3"x11", 19" stroke **\$ 18.49**
- Fire Alarm Control **\$.99**
- Abrasive Stones (Kit of 10) 1 1/2" bore **\$ 3.98**
- Heater Coils, 2000-w, 110-v. **\$.99**
- Barometer, Beautiful precision unit **\$ 5.95**
- Bolt-Screw-Nut Mix. A buy! 8 lbs. **\$ 1.99**
- Hundreds other bargains in tools, electronic items, radio, etc.

POWER GREASE GUNS

- Genuine Lincoln. Automatic. Powerful, quick, work on any air compressor. Complete. Mfrg. price **\$61**. SALE **\$29.85**

WINCHES and HOISTS

- Boat, dock, utility hand winch, 1-4 gear ratio, 1500 lb. **\$19.95**
- Industrial light duty. Hand 1-3, 1-9 ratio, 2000 lb. **\$29.95**
- Cable 1/4", 50', with load hook **\$8.95**
- Contr. hvy. duty, hand, 10,000 lb. 1-5, 1-27 ratio **\$89.54**
- Heil Power Winch, 15,000 lbs. with 150' 1/2" cable, Cost \$200 **\$179.00**
- Capping Chain Hoist. Lever ratchet type, 3000 lbs. 100s of uses. Special value, **\$19.92**

G. E. DICTATION RECORDERS

- 110-v. 60c. For home or office—child training, etc. A four-star buy! SALE **\$29.50**

Write for special Water Pump catalog-data

TRACTOR WEED SPRAY OUTFITS

- Farm Special (good to June 1 only) 5-row all brass T-jet boom, P.T.O. bronze gear pump, hose, all fittings and controls. Universal mounting. Regular **\$140.50** **\$79.50**



Wind Driven Power Plants

- Ideal for lights, radio, battery charging. Fine for remote camps, farms, etc. Complete, 6-volt, 30 amp. D-C generator, 7-ft. propeller, relay, 6-ft. steel tower, etc. Brand new. Original cost \$95. SALE **\$33.95**



BURDEN SALES COMPANY

809 "O" ST.,

LINCOLN, NEBRASKA

Start Your Own Welding Business with a HOBART "Simplified" arc welder

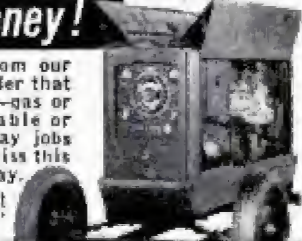


Go after WELDING jobs that Pay Big Money!

Write today for complete details on this PROFIT MAKING OPPORTUNITY. No Obligation!

Never before has the demand for welding been so great—the profits so large. That's why smart operators everywhere are setting up their own welding business... and you can do the same.

SIMPLY CHOOSE from our complete line, the welder that best suits your needs—gas or electric drive—portable or stationary. The big pay jobs are waiting, so don't miss this opportunity. Write today.



HOBART BROTHERS CO., Box M-52, Troy, Ohio

"One of the world's largest builders of arc welders"

HOBBYISTS! SHOPMEN! Special ONLY \$54.50

PALMGREN "HOBB-E" Rotary, Index, Milling Table

Ideal for Model Parts or Shop Work
Mill-Grind-Drill-Index-Rout curved or straight-Rabbit and Mortise on drill press or lathe. 8" Table, 4" Cross Feed, 360° Rotation, Accurately Graduated. Bolts to table. Order NOW! SAVE \$100. Only **\$54.50**. Less Rotary Feed **\$43.75**. Write for "HOBB-E" Tool Circular.



CHICAGO TOOL and ENGINEERING CO. 8365 South Chicago Ave. Chicago 17, Ill.

START THE JOB RIGHT

EMPIRE LEVEL



EMPIRE No. 151 Aluminum Level. Six adjustable vials, easily replaced — twin levels, plumbs and 45° optional twin level and plumbs — 24" . . . Only **\$7.50**.



See EMPIRE at your dealer, or write for booklet "How to Choose and Care for your Level."

EMPIRE LEVEL MFG. CO.

Dept. PM, 10930 W. Potter Road, Milwaukee 13, Wis.

say you saw it in POPULAR MECHANICS

Genuine VISE-GRIP WRENCH



Jaws LOCK To Work with Ton-Grip —Leave Hands Free

Does jobs no other tool can do. Easily turns rusted or battered nuts, bolts, screws — makes ideal hand-vise — hundreds of other uses. **LOCKS, CLAMPS, TWISTS, TURNS, PULLS, RATCHETS, HOLDS!** With Cutter — No. 7W, 7", **\$2.25**; No. 10W, 10", **\$2.60**. Without Cutter — No. 7C, 7", **\$1.95**; No. 10C, 10", **\$2.25**. Straight Jaw model — No. 7, 7", **\$1.85**; No. 10, 10", **\$2.15**.

Order Genuine VISE-GRIP From Your Dealer. **PETERSEN MFG. CO., Dept. P-5, DeWitt, Nebr.**

Make Dad Happy On Father's Day!

OLD-TIME
AUTOS in
MINIATURE

\$1.95 to \$3.95
THEY'RE SUCH
FUN TO BUILD!



Check "OLD TIMERS" You Want To Give:

- 1904 Olds \$1.95
- 1911 Maxwell \$2.50
- 1910 Model "T" Ford \$2.50
- 1909 Stanley Steamer \$2.95
- 1909 Model "T" Ford \$2.95
- 1903 Rambler \$2.50
- 1911 Buick "Bug" \$2.50
- 1903 Model "A" Ford \$2.50
- 1902 Air-Cooled Franklin \$2.50
- 1906 Columbia Electric \$2.50
- 1910 International Harvester \$2.95
- 1900 Packard \$2.50
- 1903 Cadillac \$2.50
- 1914 Stutz Bearcat \$3.95
- 1913 Mercer Raceabout \$3.95
- 1906 "Old 16" Locomobile \$3.95

FATHER'S DAY— Sunday, June 15th, and what gift is more nostalgic than an "Old Timer" he can build in his leisure hours? These miniature 3/4" scale models are so authentic they are on display in famous museums. 6" to 10 1/2" in length when completed. Set includes history of car; also step-by-step instructions make it easy to assemble set! All completely pre-fabricated, with ready-shaped parts, die-cast die-cast plastic wheels, radiator, horn, lamps, etc. Nationally known; satisfaction guaranteed. A toy, hobby and dept. store. Perfect gift for fathers, young or old. Order a complete set today!

Write to us — Add 25¢ for postage and handling. No. C. O. D.'s please

hudson miniatures **OLD TIMERS**

"Originators of Antique Autos in Miniature"

SCRANTON HOBBY CENTER, Dept. 14, Scranton 10, Pa.

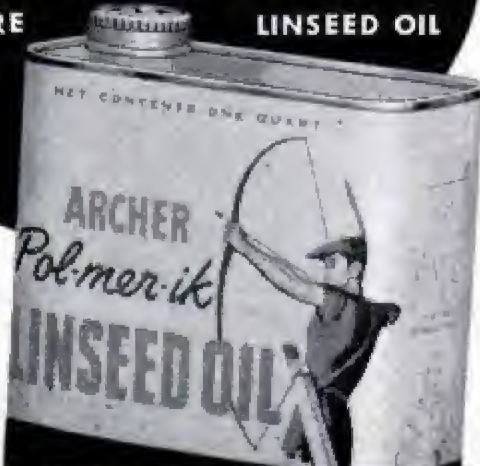


MAKE
OLD FURNITURE
NEW AGAIN

ARCHER
Pol-mer-ik

100% PURE LINSEED OIL

FREE BOOK
Refinish, beautify, polish all woods. "101 Handy Hints." Send for today.

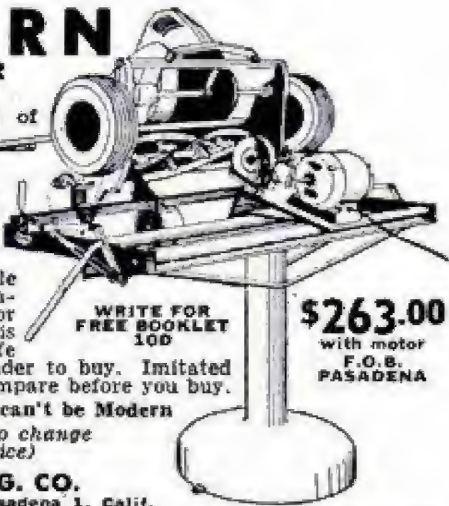


ARCHER · DANIELS · MIDLAND CO.
603 Roanoke Building, Minneapolis 2, Minn.

MODERN

LAWN MOWER SHARPENER

Service departments of leading Lawn Mower manufacturers use the Modern Lawn Mower Sharpener. One lever moves lawn mower into grinding position. Gasoline and oil remain in engine while sharpening, no dismantling of wheels, roller or handle. The Modern is a precision bed knife grinder—no extra grinder to buy. Imitated but never equaled—Compare before you buy.



WRITE FOR FREE BOOKLET 100

\$263.00
with motor
F.O.B.
PASADENA

If it isn't a Modern it can't be Modern
(Prices subject to change without notice)

MODERN MFG. CO.

160 N. Fair Oaks - Pasadena 1, Calif.

100 MILES to a GALLON!

with **VELOCETTE** Motorcycles

ECONOMICAL • SAFE • FAST

Motorcycles for PLEASURE As low as

• BUSINESS • TRANS- \$599.50

PORTATION available

Write for complete information.

Exclusive U.S.A. distributor



BRANCH MOTORCYCLE SALES 2019 W. Pico Blvd. Dept. PS
Los Angeles 6, California

Build World's Finest Crystal Radio

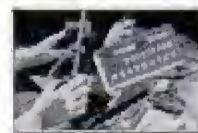
EASY to make. Assembled in minutes. Gets distant stations clearly. Uses Germanium Crystal Diode in special constructed circuit. Very selective. All parts laboratory quality engineered for best performance. Head phones included. Nothing extra to buy. Sold on money back guarantee. Complete kit \$8.95 prepaid. (C.O.D. on \$1.00 deposit.)



R. A. JAEGER & CO.
8044 HAMLIN AVE.,
SKOKIE, ILL.

STARRETT "Tools and Rules" BOOK

Describes and illustrates the precision methods skilled mechanics use. Only one dime. Write Dept. AP.



THE L. S. STARRETT CO., Athol, Mass., U. S. A.

Start a NEW BUSINESS!

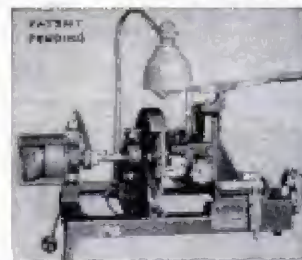
or Add to your present
Repair Business

SHARPEN DULL PIPE WRENCHES

PIPE TAPS & DIES

"GUM" CIRCULAR SAWS

Write for information



J. C. MOORE INDUSTRIES
BOX M 276 FREDONIA, PA.

WANT TO **SAVE GAS?** NOW USE GANES **1/2 MILLION**



AMAZING **GANE** TRY ONE **FREE** NEEDLE IN YOUR CAR!

TRY BEFORE YOU BUY!

MANY GANE NEEDLE USERS REPORT UP to 25% more mileage, faster pickup, easier starting and smoother idling. NOW TEST A GANE NEEDLE IN YOUR CAR for ten days, then compare your mileage and performance. If satisfied, send \$1.50 per needle (8 cyl. cars take 2). If not satisfied, just return it—fair enough? Since authorities differ on its merits and some users report no improvement, TRY BEFORE YOU BUY! Gane Needle replaces idling adjustment screw in carburetors—easily installed in a few minutes.

WRITE TODAY. ENCLOSE NO MONEY. PAY POSTMAN NOTHING. Just send us your name, address, and make and year of car. **NATIONAL AUTOMOTIVE RETAIL CORP., Dept. J-5**
350 W. Washington Blvd. Venice, California

FREE
Auto Economy Manual

Tells how to save gas, tires, brakes, etc. Also introduces many new economy products. (Sent absolutely free to all who try Gane Needles.)

AGENTS! SALESMEN!

Big profits with the Most Needed Item IN EVERY HOME, SHOP OR STORE!

NEW! Miniature Screw Driver Kit

It's easy to sell these new screw driver kits to every home or business. Everyone wants them! Make every call a sale! Two regular blades, 1/8" x 3 1/2" and 3/16" x 4 1/2", one Phillips type 3/16" x 4 1/2". Shock and shatter proof amber plastic handle with positive-hold screw chuck. All in a tough, handy Vinyl plastic roll case. Retail price \$1.25



SELL THEM TO:
HOBBYISTS
HOUSEWIVES
MECHANICS
REPAIRMEN
SERVICE MEN
ALL BUSINESSES

YOUR PRICE

1 set 70c 6 sets \$4.00

12 sets \$7.50

DON'T WAIT—WRITE TODAY!

SCHNEIDER & SHIER, INC.

502 N. Dearborn St., Chicago 10, Illinois

HOBBYISTS—SEE HERE—

DENTAL INSTRUMENTS ALL 8 \$1.98 ONLY



IDEAL for working in plastic, wood, leather, clay, plaster, etc. or as scribers. Many other uses—overall length 6"—Government Surplus—all new!

150 Piece HOBBY MIX for elec. Grinders . . . a mere **98c**

Parcel Post and Handling 25c for 1 item. 35c for 2 items. Write for FREE CATALOG of Government Surplus Bargains.



Dental Specialty & Sales Co., Dept. PMS, P.O. Box 692, Great Neck, N.Y.

BIG LEATHER & CRAFT CATALOG!

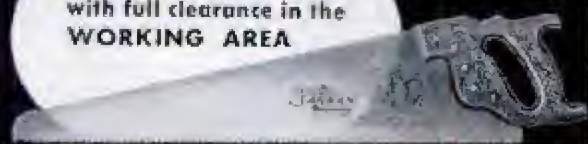
1,000's of items for Leathercraft, Textile Painting, Copper Tooling, Kits, Projects, Tools, Supplies, Etc. Send 25c (refunded with 1st order) to:

RUSSO HANDICRAFT SUPPLIES Dept. CD-11, 245 S. SPRING LOS ANGELES 12, CALIF.

A HOLLOW GROUND Hand Saw
World's First and Only Saw Blade
That Has Maximum Clearance
WHERE YOU NEED IT MOST!

The ONLY BLADE
with full clearance in the
WORKING AREA

Patent
Pending



For the easiest, fastest, smoothest sawing action known, get a hollow ground saw!

FREE Valuable tips on easier sawing, and hints on saw care. New folder shows amazing advantages of hollow ground hand saws over ordinary taper-ground saws. Send for free copy today.

THEY COST NO MORE!

Sold thru dealers only

The LARSAN Mfg. Co. 23 South 11th St., Newark, Ohio



YOU DON'T HAVE TO

THROW

THE BAIT WITH

Actionrod

Just flick your wrist. There's no work, no "throwing" with Actionrod—live tip action lets you cast light, medium or heavy lures with ease and accuracy.

Actionrod is America's favorite glass rod. It's lighter—you can fish all day without tiring. It's stronger—you can strike quick and hard—it has all the power you need to land the big ones.

Pick the Actionrod to fit your casting needs. Bait casting, trolling, spinning and fly rods in solid and tubular glass—\$5.95 to \$37.50.

Ask to see the new tubular glass Actionrod fly rods—as low as \$11.95!

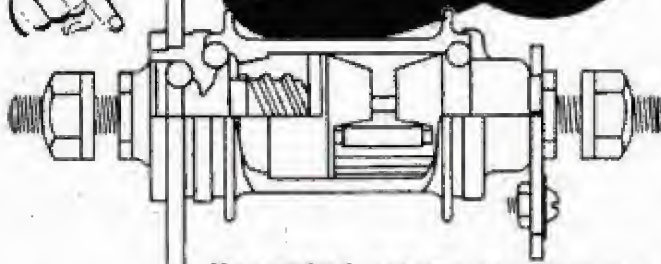


Actionrod

AMERICA'S FAVORITE GLASS ROD
ORCHARD INDUSTRIES, INC. 16404 MORANG ROAD, DETROIT, MICHIGAN



**KNOW YOUR
COASTER BRAKE
INSIDE and OUT!**



**Ride
a Bike
- it's
Fun!**

Unmatched construction features make the Bendix[®] Coaster Brake the outstanding performer in its field. That's why Bendix Coaster Brakes—stop quicker—pedal easier—coast farther—last longer. Your bicycle dealer will put on the brake you want—so just say "Bendix Coaster Brake."

*REG. U.S. PAT. OFF.

**DOUBLE THE FUN
WITH A  COASTER BRAKE**

ECLIPSE MACHINE DIVISION of
Elmira, New York

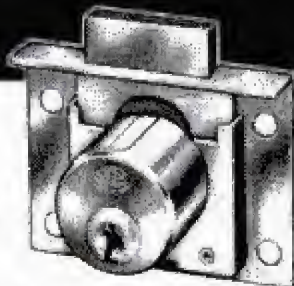


**AT YOUR HARDWARE
DEALER'S**



**CABINET
LOCKS**

**For: DESKS
CHESTS
CABINETS
WARDROBES
DRAWERS**



Put easy-to-install Corbin Cabinet Locks on all your cabinet work and you'll enjoy both pride of craftsmanship and real security!

They keep valuable papers secure . . . protect guns and tools . . . medicines and caustics.



There's a Corbin Cabinet Lock or padlock for every purpose. Ask for them at better hardware stores everywhere.

CORBIN CABINET LOCK DIVISION

The American Hardware Corporation, New Britain, Conn., U.S.A.

!!! SAVE \$25.00 !!!

16" ELECTRIC, made by a leading rotary mower builder to sell at \$64.50, only

\$39.50
FOB
K.C.,
MO.

- 1/2 H.P. Delco motor with over-load switch.
 - Trimmer type aluminum alloy base.
 - Adjustable floating handle.
 - 1-2-3" cutting heights.
 - 3 replaceable knives.
- Shpg. wt. 46 lbs. Send check or M.O. for 39.50. Shipping charges collect.



(Use #16 or heavier cord)

**LIMITED
SUPPLY!**

Write for literature

WESTPORT INDUSTRIES
Box 5870, WESTPORT STATION, KANSAS CITY, MISSOURI



Ask Your Hardware Store for
FULLER'S
Unbreakable Amber Handle
SCREW DRIVERS

America's most popular line of moderately-priced screw drivers! Wide range of sizes. Fuller Tool Co., Inc., 915 Faile St., New York 59 World's largest makers of Amber-Handle Tools
Export Sales Dept., John H. Graham Co., 105 Duane Street New York, U.S.A.

For precision accuracy when grinding—
use a **DUMORE Flex-Shaft tool**



Versatile Hobby-Flex — easiest to use in tight places. Pen-type holder. For all 1/8" and 3/32" accessories. 15,000 RPM. Standard — \$24.50. De luxe, with case and 10 accessories—\$29.50. Send check or money order. We pay postage

The **DUMORE** Company
1300 Seventeenth St. Racine, Wis.

SHOPSMITH OWNERS

New attachment for turning metal and plastic, adaptable for tapping, milling and grinding, fully guaranteed, only \$13.50, order direct, enclose check or M.O. \$5 deposit for COD.

DIXIENG, 7301 N.W. 10th Ave., MIAMI 38, FLA.

AMAZING NEW TINY RADIO



FITS IN YOUR POCKET — REALLY WORKS
No tubes. Batteries or electric AC hookups needed! Has V.H.F. crystal diode — EZ tuning dial — Red plastic cabinet — Clear-tone phone. Guaranteed to work most anywhere you go on local stations. Should last for years! SEND \$1.00 (bill, ck, m.o.) and pay postman 83.99 C.O.D. postage or send \$1.99 for p.p. delivery. Limited Time Offer—includes O.K. Aerial kit, Real fun—Wonderful Gifts. Sold only by mail from

MIDWAY CO. DEPT. BPM-5 KEARNEY, NEBR.

Say You Saw It in Popular Mechanics

\$14
POST PAID

PRECISION CALIPER

M.Z.B. Vernier Calipers guarantee highest accuracy for any kind of precision work. This chrome-steel, spring-tempered instrument measures inside, outside, thread and depth to .001" and 1/20mm (#30-64) or .001" and 1/128" (#30-61) 8" overall 6" graduation. Glass hard measuring surfaces. Either one also available in stainless steel at \$16.50 each. We also stock 12" Calipers with fine micrometer adjustment, and height gauges and 1" micrometers reading .0001".

Leather Cases \$1.00 extra. You pay postage on C.O.D. Money Back Guarantee. We are interested in contacting representatives for several territories.

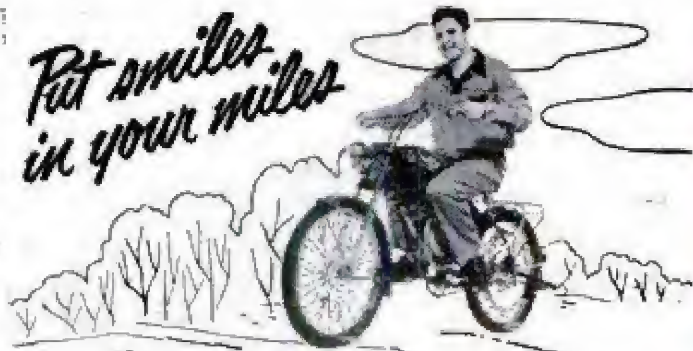


The trade mark of highest quality

Send for descriptive literature, also on our fine imported precision pliers.

INTER-CONTINENTAL TRADING CORP.
90 WEST STREET, NEW YORK 6, N. Y.

*Put smiles
in your miles*



Get a WHIZZER motor!

- 3 horsepower
- 138 c.c., 4-cycle
- Up to 100 miles per gallon of gas

Here's the new 700 Series Whizzer motor! *Everything* to make any man's standard bike a complete motorbike! Look what you get when

you buy this 1952 Whizzer motor: 3 h.p. motor with built-in generator, lights, controls, gas tank, all mountings in a single, low-cost package. Put it on your bike and go anywhere, 5 to 35 m.p.h., comfortably, safely, dependably. For real fun and riding pleasure, get a Whizzer NOW! See your dealer or write today.

WHIZZER MOTOR CO., 304 S. Sanford, Pontiac, Mich.

2 DRILLS in 1

\$11.95 most paid

Send check or Money Order
Satisfaction guaranteed
Order yours now

This attachment gives you two drills in one. It converts any 1/4 inch electric drill to 1/2 inch capacity. Reduction gears reduce the drill speed 5 to 1, the average speed of a 1/2 inch drill, and thereby increases the power. Absolutely indispensable for all shop work and home craftsmen.

G. M. CO. MANUFACTURING, INC.
1308 43rd AVE.
LONG ISLAND CITY 1, NEW YORK

"YANKEE" VISES

*hold work through every step
without a misstep*

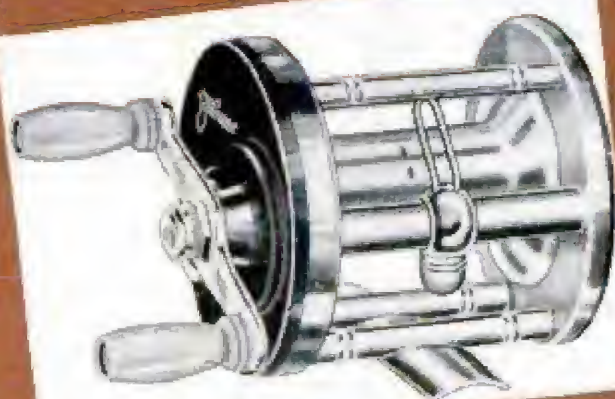
Any job locked in a "Yankee" Vise, is correctly positioned for every operation . . . hand or machine. Lifts on and off swivel base at bench. Machined accurately . . . top, bottom, sides and front end . . . V-grooved block for rounds. Four sizes, with and without swivel base . . . 1 1/2", 2", 2 3/4" and 4" jaw widths. At your dealer's.

Write for "Yankee" Tool Book

YANKEE TOOLS NOW A PART OF
NORTH BROS. MFG. CO. Dept. 4 **STANLEY**
215 W. Lehigh Ave., Phil. 33, Pa. **THE TOOL BOX OF THE WORLD**

Bronson Presents

*The finest reel
money can buy!*



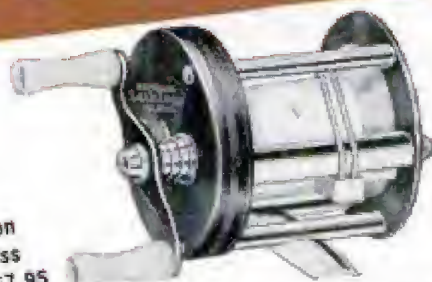
J. A. Cox 25-C Coronet
\$33.00

... with the sensational
one-piece spool



You'll agree it's the finest when you see this new Bronson-made automatic free-spool reel. Handles automatically disengage and do not turn on the cast. One-piece aluminum spool is the lightest yet, weighs only 33/64 oz. It's stronger, too—and machined inside and out for perfect balance. Spool revolves on a stationary shaft for perfect alignment. 10-second takedown without tools.

Bronson
Lashless
1710—\$7.95



For a lightweight reel at a medium price, choose the Bronson Lashless. Precision built, beautifully balanced, modern in every detail. Green anodized aluminum, weighs in at 4 3/4 oz. 3-piece takedown, snap-on plastic arbor. Famous Bronson Duo-Pawl doubles the life of the reel. Take a new Cox or Bronson reel on your next fishing trip. \$2.95 to \$33.00.

Bronson

WRITE FREE CATALOG Bronson Reel Co., Bronson, Michigan
Dept. F (Division of Higbie Manufacturing Co.)

No. 150 UK

Speed Way Speed Sander KIT

Sands
Smooths
Polishes
in
minutes



Kit Complete \$39.50

Every home needs this kit for finishing and re-finishing furniture, woodwork and metal surfaces ... for smoothing walls ... for cleaning, burnishing and polishing. It does professional work easily in minutes that would take tedious hours by hand.

Kit includes the famous, motor driven, orbital motion, all-ball-bearing, die-cast-aluminum No. 150 Speed Sander; 18 abrasive covers (3 grades); 2 Felt Pads for free abrasives; Thick Sponge neoprene pad for curved surfaces; Lambs wool polishing cover and permanent template for cutting 3 covers from standard 9"x11" abrasive sheets.

Each kit in a fitted display carton. Ask your local dealer to demonstrate it.

Write for Catalog Sheet

Speed Way MANUFACTURING CO.
1863 So. 52nd Ave., Cicero 50, Illinois

A WORLD CHAMPION

for Low Cost Transportation!

Cushman

TOTAL OPERATING COST 3/4¢ per mile

- FAST
- CONVENIENT
- ECONOMICAL
- NO PARKING PROBLEM

Cushman—the world's best buy when it comes to economy—75 miles per gallon—up to 40 miles per hour—superior riding features—easy to own, maintain and operate. You get maximum power and dependability with Cushman. Over fifty years of engineering experience. Go Cushman this year. You'll be time and money ahead.

Write today for Free Illustrated literature. See your nearest Cushman dealer.

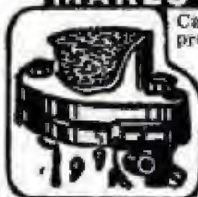
CUSHMAN MOTOR WORKS, INC.
923 NO. 21 ST., LINCOLN, NEBRASKA

"PAINT-DOZER" BIG JOB
Outside-Inside Paint Peeler
\$9.95 complete

Strip paint to bare wood at rate of 6-10 feet per minute! Big 16 sq. in. heating area blisters paint... attached rear blade strips it off in *one continuous motion!* Ideal for house exteriors, boats, cabinets, all woodwork. Excellent painter's tool! Faster, neater than blow-torch! Operates on household electric current. Even beginners do fast, clean work with "Paint-Dozer". Has long-lasting ceramic 1,000° Hi-Temp heating element; heavy stamped-steel construction; Marinite insulation; pistol-grip hardwood handle. Complete with front and rear detachable blades and skids; groove and ridge cleaners; 8 ft. neoprene cord; safety stand; attachable front guide handle for horizontal work. *Fully guaranteed!* Order from your dealer, or write today for this professional tool. *Fast shipment.*

OTTO KONIGSLOW MFG. CO., DEPT. P
3610 PERKINS AVENUE • • • CLEVELAND 14 • OHIO

**CARBURETOR TOO RICH
MAKES MOTORIST TOO POOR**



Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all cars, trucks and tractors. It is automatic and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits! Send name, address on a postcard for free particulars and how to get yours for introducing.

VACU-MATIC CO., 7617-1893 W. State St., WAUWATOSA, WIS.

ARRO-PING —the Original Arrow Sling-Shot has accuracy and power for small game or target with swift ping of an arrow. Sturdy, smoothly-made wood stick, guided-flight barrel, slender metal-tipped 12-inch arrows. Powerful rubber propulsion sends arrow 300 feet. Try skill in a new hunting thrill.

Postpaid, with five Arrows, \$1. Or Arrows alone 20 for \$1.

ARRO-PING CO.
Box 25H West End Station,
Colorado Springs, Colo.

LAWN ORNAMENT-NOVELTY PATTERNS
28 Lawn Ornament Patterns, 25c. Other Patterns: 15-20" high: Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, \$1.00 Postpaid. Strother Pattern Service, Dept. CX-8, Box 129, Beltington, W. Va.

BRONZE FOUNDRY
Schools and Home Workshops
Make your own castings of aluminum, copper, bronze, silver. Foundry sets are available in three sizes including 2400 Deg. F. blast Furnaces. \$22.50; \$29.50; and \$42.00, f.o.b. Kansas City. Free Circular.

KANSAS CITY SPECIALTIES CO. P. O. BOX 5022, DEPT. P-5
KANSAS CITY, MO.

64" Flexible Shaft
WOVEN WIRE CORE

USE AS ELECTRIC DRILL

only \$5.95

REAL BARGAIN—cannot be duplicated for \$15.00. Coupling fits 1/2" motor shaft; other end fits standard chuck. Durable, heavy. Use it for grinding, polishing, buffing, drilling, etc. Chuck for same—\$1.25.

SEND NO MONEY—ORDER TODAY. This low price can't last. Pay postman—plus postage. Send check or money order and we will ship P.P. prepaid. Money refunded if not satisfied.

HARRY W. RETTEW
400 WEST AVE., JENKINTOWN, PA.

EASY TIME PAY PLAN

What? POWER TOOLS only \$16 EACH!

GRINDER
SANDER
30" LATHE
HORIZONTAL DRILL PRESS
6" TILTING TABLE SAW

5 POWER TOOLS IN ONE

FACTORY TO YOU \$79.95

SUPERSHOP offers you a precision-built complete power tool workshop. 100% ball bearing, RUGGED, Accurate. Big capacity. 15 day FREE trial. Money back guarantee. Mail postcard for FREE catalog. Buy on easy pay plan.

POWER TOOLS, INC. 135 YATES AVENUE BELLOIT, WISCONSIN



VERTICAL DRILL PRESS

FISHERMEN! BACKLASH IMPOSSIBLE
with the New **KANT-Lash Reel Adapter**

AT LAST—an anti-backlash device that works. A Precision governor that "prevents backlash without the help of any braking device... offering greater distance & accuracy" say our four Editors of POPULAR MECHANICS, Apr. '52, p. 254. Fits old or new bait casting reels. "On" in 30 seconds. KANT-LASH must work for you or money refunded. Send \$2.95 for

ONLY \$2.95
POSTAGE PAID

RENE-CRAFT PRODUCTS 210 OWENS BUILDING WILMETTE, ILLINOIS

4 TOOLS IN 1
The Complete **METAL WORK SHOP**
FOR HOME AND PLANT

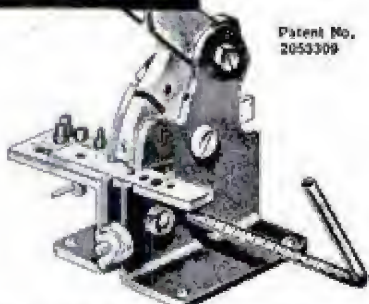
Height 5"
Width 8"
Length 13"
Weight 8 lbs.

IT FORMS SHEARS PUNCHES RIVETS

Introductory Price

ONLY \$6.95 DELIVERED

Ideal for hobbyists, craftsmen, radio repair, metal shops, garages, bicycle repair shops, model manufacturers, experimental laboratories, etc. Check must accompany order. Money refunded if not fully satisfied.



Patent No. 2053309

ALBERT J. TATU
85 Columbia Dr. (Dept. 112) Williamsville, N. Y.

RELIEVES HEADACHE NEURALGIA NEURITIS PAIN

FAST



Here's Why...

Anacin® is like a doctor's prescription. That is, Anacin contains not one but a combination of medically proved active ingredients. Anacin is specially compounded to give FAST, LONG LASTING relief. Don't wait. Buy Anacin today.

LOW FACTORY PRICES

Sensationally New For 1952!
MIDWEST Television
and
5 Wave Band RADIOS

20-INCH Rectangular **PICTURE**

EASY TERMS

Beautiful consoles and complete shells for easy installation in your own cabinet.

30 DAYS TRIAL - FACTORY-TO-YOU
WE PAY TRANSPORTATION CHARGES.

Special Bonus Gift!



Illuminated TELEVISION CLOCK

Given With Every Purchase of a **MIDWEST RADIO or TELEVISION**

LIMITED TIME ONLY!

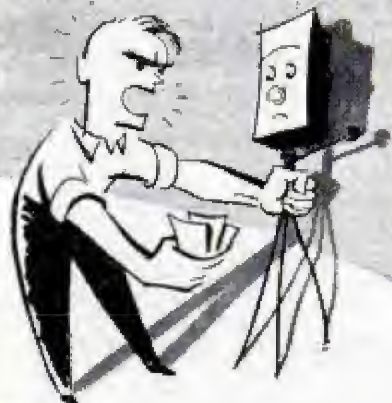
Phone For **FREE 1952 MIDWEST CATALOG**
IN NEW YORK MURRAY Hill 2-6810 IN CHICAGO State 2-5600
IN CLEVELAND Prospect 1-7450 IN PITTSBURGH Grant 1-0609
IN DETROIT Woodward 3-1233 IN ST. LOUIS Grand 1161
IN PHILADELPHIA Locust 4-1035 ... or send coupon below

SEND THIS COUPON For FREE MIDWEST 1952 Catalog

MIDWEST RADIO & TELEVISION CORP.
Dept. 25M, 909 Broadway, Cincinnati 2, Ohio

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Don't blame your Camera



when it's exposure that's wrong!

There's no longer any excuse for badly exposed pictures... either stills or movies. A WESTON Exposure Meter will instantly give you the correct exposure settings every time you use your camera. You'll get perfect pictures in or out-of-doors, even in full color. Ask to see the WESTON at your dealer's today.



WESTON

EXPOSURE METERS

The Meters Most Photographers Use



Send for this **BIG NEW** Hunt's **WOODWORKERS CATALOG NO. 18**

NEW LOW PRICES

ONLY **15c**

Offers greatest selection of fine domestic and imported woods--and hundreds of woodworkers items at bargain prices!

You'll save time and money with this big, new catalog. Contains everything wood craftsman needs. Shows 32 rare and fancy woods in color...43 veneer designs...275 scroll patterns...multicolor inlays, overlays, bandings...all kinds of tools, machinery, cabinet hardware, ornaments, mouldings...and pages of valuable tips, ideas, information, instruction. Send for your copy NOW. Only 15c

144 PAGES

QUICK DELIVERY

on maple, poplar, oak, mahogany, red cedar, cherry, walnut, and many others—all properly seasoned and kiln dried.

MAIL THIS COUPON--TODAY!

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. A-5
Chicago 8, Illinois

Send me the big, new, money-saving Catalog No. 18. Enclosed is 15c

Name _____

Address _____

City _____ Zone _____ State _____

SENSATIONAL OPTICAL BARGAINS

USEFUL 80 POWER BABY MICROSCOPE IMPORTED

A little gem, gives astounding sharp definition! Good 5" High! Only Just **\$4.00** Postpaid



SLIDE PROJECTOR SETS Consists of an unmounted lenses you need to make the following size projectors:
Stock #4029-H-35 mm. \$2.85 Postpaid
Stock #4036-H-35/4 \$3.25 Postpaid
Stock #4039H-2 1/2" x 3 1/2" \$3.95 Postpaid

SIMPLE LENS KITS let showing how you can build lots of optical lenses. Use these lenses in photography and for dozens of other uses in experimental optics, building TELESCOPES, low power Microscopes, etc.
Stock #2-H-10 lenses \$ 1.00 Postpaid
Stock #3-H-45 lenses 5.00 Postpaid
Stock #10-H-80 lenses 10.00 Postpaid

We Have Literally Millions of War Surplus Lenses and Prisms for Sale at Bargain Prices. Numerous Types of Instruments. Tool Write for FREE CATALOG

EDMUND SCIENTIFIC CORP., Barrington, N. J.

WELD

BRAZE, SOLDER, and CUT →

ONLY \$1475

F.O.B.

complete!

No experience needed. Follow simple instructions, weld on iron, steel, bronze, brass, aluminum, and other metals. Plugs into any properly wired 110 volt A.C. or D.C. line. Make or save time and money doing repair work for yourself and others. Repair men, farmers, tinsmiths, home and auto owners, hobbyists, etc., say **FOUR-WAY** pays for itself over and over. Order today or send for free details.

Larger Equipment Available on Request
FOUR-WAY WELDER COMPANY, Dept. F2-EC
2326 S. Michigan Ave. • Chicago 16, Illinois

ORDER NOW
10 DAY TRIAL

DO MORE PLANING JOBS WITH LOW-COST BELSAW \$215.00

AMAZING 12 1/2-IN. PLANER Does All Ordinary Planing Mill Jobs. Provides attachments for Jointing, Rabbeting, Tongue, Groove, Matching. 12 1/2 x 6-in. capacity, 3-knife solid round all-steel cutterhead. Power feeds at 24 feet per minute, 42 cuts per inch. Provides for full line of accessory attachments—Grind and Joint Knives IN THE CUTTERHEAD WITHOUT REMOVING.
BELSAW MACHINERY CO.
1019 Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

World's Fastest Boats!



Be a champion! Drive a high speed Champion Boat! Build one yourself from easy-to-follow plans—or we'll build for you. Send 25c for catalogue with pictures, descriptions, low prices of hydroplanes. 3 points, utilities, other models. **Champion Boats, 1524 W. 15th St., Long Beach 12, Calif. Dept. 15-R.**

SAY YOU SAW IT IN POPULAR MECHANICS

Own this AMAZING, NEW TOOL



100's of USES

MAKES PERFECT GIFT FOR FATHER OR SON...

Home craftsmen, carpenters, plumbers, electricians, many others. Simple turn of protractor dial gives you angle desired or drop per foot wanted—quickly, easily, accurately. Unbreakable extruded magnesium 24-inch level—1/4 lighter than aluminum—only \$8.80. If your dealer can't supply you, order direct. Postage prepaid with cash, check or M.O., or order C.O.D. Dealer's name must accompany order. (Other sizes available). Dept. M

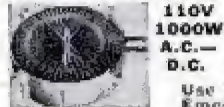
PAT. APPLIED FOR
J. H. SCHARF MFG. CO., Omaha, Nebraska

PUROLATOR OIL FILTERS



Permanent Type Brand New!
G 159J-40. The perfect filter to keep motor oil or hyd. fluid clean at all times. Protect your pump, engine, radiator, or boat with this unit. Just turn handle and element is clean. Inlet and outlet ports take pipe or straight threads up to 2 1/2". Accommodates 10 GPM at 30 PSI. Mtg. bracket. Shop. wt. 4 lb. \$13 val. **\$3.95** FREE! 2 male Reducer Connectors given with every Filter.

Brand New HEATING UNIT



110V
1000W
A.C.—
D.C.
Use for Glue Pots, Brooders, Cooking, Portable Emergency Room Heating, etc.

U. S. Army bought them for heating shelter tents. The element is totally enclosed in die-cast metal. Does not glow when hot. Shockproof. Has 4 mtg. arms. Die-cast metal frame. 2 terminals. Make your own blower-type heater by mounting 6" fan back. Size 7 1/2" dia. x 2 3/4". Wt. 3 3/4 lb. **\$2.49** A real buy.

Extra Special!

CENTRIFUGAL PUMP. 240 GPH. Complete with 1/40 HP Deleco 110V, 60 C. AC, capacitor-type motor. Made by Eastern Pump Co. Wt. 12 lb. Brand New! Limited Quantity. \$35 value. While they last... **\$21.95**

ORDER FROM THIS AD!

Prices F. O. B. St. Louis, Mo. Include postage with check or M. O. Money Refunded if Not Satisfied!

Brand New AAF Type A-1 LAMP ASSEMBLY

Throws Brilliant Spot and Diffused Side Light — Ideal for Fishermen, Hunters, Campers, Boatmen, Tourists, or Whenever You Need Emergency Lighting!

Bought by the USAF for lighting tents. 9 suspension loops allow you to hang it vertically or horizontally. Plastic bubble-type lens throws focused beam and plenty of light at right angles. Sturdy steel case. Off-on switch. Uses standard 6V lantern battery. Size 11"x4". Wt. 2 lb. A tremendous value! Less batt. **\$3.95**



AVIATOR'S OXYGEN OUTFITS

Brand New! Bail out type. Consists of all metal tank, brass release valve, 0-3000 lb. gauge and breather hose, all enclosed in khaki colored canvas bag. Tanks are charged with breathing oxygen at 1800 lbs. pressure. Ideal emergency oxygen supply for airlines, mountaineers, firemen, paint shop workers, diving outfits, etc. Shipping weight, 4 lbs. **\$5.95** NOW ONLY.

Aviator's Oxygen Mask—Demand type. Type A-14. 2 1/2" rubber tube. Brand New! Only **\$1.95**

Use for Glue Pots, Brooders, Cooking, Portable Emergency Room Heating, etc.

NOW-32 DRAWERS PRICED \$200 LESS THAN LAST YEAR. SEND ORDER TO

Famous All-Metal PARTS CHEST

keeps all small things handy. Heavy, welded steel case, 6" x 15 1/4" x 12 1/2", gray enamel finish. No-rust aluminum drawers 1 1/4" deep, 2 1/4" wide. 5 1/4" long with pulls and index cards. 64 slide-in dividers make 96 compartments. Bargain buy **Only \$10.95**

16 Drawers **\$6.95**
6x8 3/4"x12 5/8"
NO C.O.D. — POSTPAID

CANTON CABINET CO.

1014 Tusc. W. CANTON, OHIO



HURRICANE CUT-OUT EXHAUST

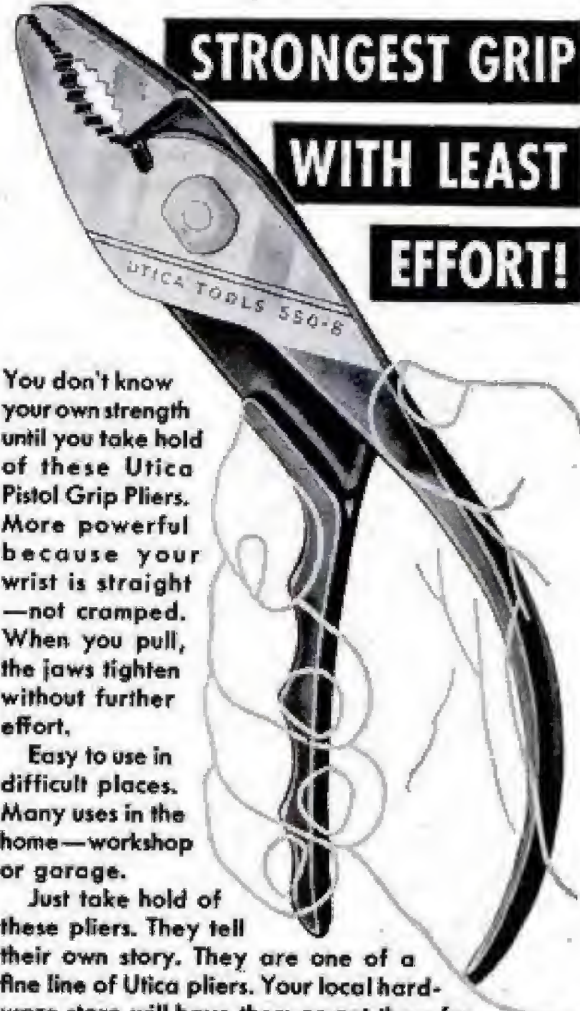
This specially engineered cut-out enables you to install special pipes and mufflers without removing the original muffler.

Now control your exhaust tone from a dash control button. Cut back into your original muffler in restricted areas at will. Fits all exhaust pipes from 1 3/4" to 2 1/4" size.

This cut-out is well constructed; actually strengthens exhaust pipe; made of heavy plate steel, designed for easy installation—no special tools required. Sent post-paid for only \$6.95 check or money order. Satisfaction guaranteed or your money back.

ST. LOUIS PRODUCTS CO., Box 24-A5, Normandy 21, Mo.

STRONGEST GRIP WITH LEAST EFFORT!



You don't know your own strength until you take hold of these Utica Pistol Grip Pliers. More powerful because your wrist is straight—not cramped. When you pull, the jaws tighten without further effort.

Easy to use in difficult places. Many uses in the home—workshop or garage.

Just take hold of these pliers. They tell their own story. They are one of a fine line of Utica pliers. Your local hardware store will have them or get them for you. **FREE—descriptive folder on request.**



#550 \$2.20

PISTOL GRIP SLIP JOINT PLIERS

Utica Drop Forge & Tool Corp. • Utica 4, New York



Your **ELECTRIC DRILL** Trims **HEDGES — SHRUBS — GRASS** with **ROTO-TRIM** DRILL ATTACHMENT

Today's Greatest Hedge Trimmer **VALUE \$10.95** Yours, Postpaid, for only **\$10.95** (Less Drill)

Keep your whole yard neatly tailored... trim hedges, shrubs, and hard-to-reach grass easily and smoothly with this new, inexpensive drill attachment. **ROTO-TRIM** quickly converts any 1/4" drill into an easy handling, keen-cutting Hedge Trimmer.

Quality Built throughout. Rigid steel and aluminum construction with smooth-running hardened steel gears and cam in one-piece case. Cutting blades are 10" long, of high-carbon steel, heat-treated, precision ground and designed for maximum safety and efficiency.

Easy to Use! Quickly attached to drill—flats simplify chucking. Light weight and precision balance make **ROTO-TRIM** much easier to handle than more expensive trimmers. Handle turns blade to any angle.

Order **TODAY!** Don't miss this chance to get your **ROTO-TRIM** Hedge Trimmer Attachment while still available at today's low price of \$10.95.

UNCONDITIONAL 10-DAY MONEY BACK GUARANTEE! Send check, cash or M. O. and we'll ship postpaid—direct from factory to you.

Dept. 552 **ROTEX COMPANY** 837 WEST DAVIS DALLAS 8, TEXAS

It's easy to . . . OWN a Business!

. . . Even if NOW Employed

You can profitably operate in spare time while building a full time business with servicemen.



Clean & Mothproof Rugs & Upholstery

- \$5 Hourly Profit
- No Shop Needed
- No Experience Needed
- Nationally Advertised
- War-proof Business

If you are honest and willing to work, you can become financially independent in a growing lifetime business of your own. Alert dealers can average \$5 hourly gross profit on service they render and \$3 on EACH of their servicemen. Nationally Advertised services rendered on location in homes, offices, clubs, institutions, etc. Recommended by leading furniture and department stores.

DURACLEAN (illustrated above) cleans by absorption! Eliminates scrubbing . . . soaking . . . shrinkage. Dirt, grease and many unsightly spots vanish as if by magic. Wool fibers come to life . . . matted pile rises . . . colors revive. Upholstery and floor coverings last longer.

DURAPROOF (not illustrated) is another year 'round service. Kills moths and carpet beetles. Makes material resistant to both. Protects furnishings, clothing, and auto interiors. Only such service backed by international money-back, 4-year warranty.

Dealer sales increased during last war due to calls from customers of other cleaners who were unable to give service because short of help . . . a war-proof business.

Easy to learn. No shop needed. Operate from your own home. We furnish enough materials to return your **TOTAL INVESTMENT**. 22 years of proven success. Easy terms. Start part or full time. Write **TODAY** for **FREE** booklet and full details while territory is available.

DURACLEAN CO.

2-165 Duraclean Bldg.
Deerfield, Illinois

EAVESDROP . . .

behind the "IRON CURTAIN"!
hear Aircraft! Ships! Amateurs!

Sensational

**TABLE
RADIO
SW-54
\$49.95**



**GUARANTEED RECEPTION
ON 3 SHORTWAVE BANDS
PLUS STANDARD BROADCAST**

Turn the knob and — presto! — Radio Moscow is pouring propaganda into your ears! Turn it again and hear music from Paris, or amateurs chatting, or an aircraft control operator! Thousands have discovered a whole new world of listening pleasure with the "Mighty Midget," by the makers of radio equipment for the famed Kon-Tiki Expedition. Write for details and name of nearest supplier.

NATIONAL COMPANY, INC.
61 Sherman St., Malden, Mass.

It's New! It's Sensational!

Ideal for
**ENGINEERS
TOOLMAKERS
CARPENTERS
PLUMBERS
MECHANICS
BUILDERS**

THE EASY WAY
TO CUT IN ANY
HARD-TO-REACH
SPOT!

**Semi-
AUTOMATIC
HACK
SAW**

Special
Introductory Offer

\$2.95

De Luxe Model with Chrome
Finish \$3.95

Now you can own a hack saw that makes cuts of ANY LENGTH . . . cuts in any direction or ANY PATTERN. No more hard-to-get-at corners . . . no more problems with inside cuts! Semi-automatically does the jobs of all these tools: Padsaw, Hack saw, Jigsaw, Keyholesaw, Corrugated Iron Saw, Pipe Cutters, Shears, Etc. Revolutionary design eliminates frame! Blade is guided along groove of rigid rod. Revolutionary . . . amazingly simple to use!

**YOUNG PRODUCTS, Dept. 377
2605 ELMHURST • DETROIT 6, MICH.**

**SEND
NO MONEY**

Just send name, address. We ship immediately. Pay postman plus postage. Or, send cash, check or money order and WE PAY POSTAGE.

Insert Installed

LEAKY FAUCETS?



SUPERIOR FAUCET INSERTS stop leaks permanently. Provide all new working parts. Make worn-out faucets better than new. Easily installed. Guaranteed. Two Million Satisfied Users. Brass Model 854, Chrome \$1.00. Specify "hot" or "cold." At hardware, plumbing dealers.

**SUPERIOR VALVE MFG. COMPANY
740 SUPERIOR, W., CLEVELAND 13, OHIO**

FIX LOOSE CHAIRS

Amazing "Chair-Loc" S-W-E-L-L-S Wood!

**NOT
A
GLUE**



Penetrates wood fibres—makes them e-x-p-a-n-d, locking chair rungs, dowels, legs, handles, knobs, ladders, joints, drawers **TIGHTLY** in place. Use no metal devices or cements. **NOTHING LIKE IT!** Quick, clean, easy. Not necessary to take parts apart. Lasts years. Over 200,000 sold! **CRAFTSMEN'S SPECIAL**—1 pt. \$1.67 postpaid. Money back guarantee. Or small size 50c at Hardware and 5 & 10's. Order **NOW** from Chair-Loc Co., Lakehurst 7A, N. J.



FREE Instruction Booklet

**MODERN
TRANSPARENT
ROOF**



Plates
Repaired
15c

Genuine Dupont Plastic NEW FALSE PLATE

From Your Old, Loose Plate **NO IMPRESSION NEEDED**. New, revolutionary Duplication System actually transforms your old, loose, cracked, chipped plate into a new, natural-looking Dupont Plastic Plate with same teeth or new, natural matched teeth. **ONE DAY SERVICE!**

**Only
\$18.95**

SEND NO MONEY—Just your name and address for **FREE** details. Save at our low price! **ALL-STATE DENTAL LABORATORIES**, 22 W. Madison St., Dept. 167, Chicago 2, Ill.

**30-DAY
MONEY-
BACK
TRIAL**



TALK-SING-PLAY OVER YOUR RADIO

with the real Radio Mike! Attaches in a jiffy—full instructions given! Swell for "parties"—"cut in" on or "kid" regular network programs or put on your own broadcasts! Amaze your friends—real fun. Beautiful! Metallic Plastic 6 in. high! **12 RADIO BROADCAST LESSONS GIVEN with each mike**
SEND NO MONEY Just pay postman \$3.99 COD plus postage or send \$9.99 and we pay postage! *Radio Mike* is available only from us by mail—guaranteed.
Midway Co., Dept. MPM-3, Kearney, Nebr.

Salesmen CHECK (✓) HERE!



**TO MAKE THIS YEAR — \$1,000? \$4,000?
\$8,000? \$15,000? More?**

Will you reach your financial goal with the product or service you are now selling? If you aren't satisfied with your present income . . . what you need is just one hour alone with the **SALESMAN'S PRODUCT RATING GUIDE**. Not a "course"—but a book of knowledge—**FACTS** for men who sell. Over 2,000 deals and offerings by most every company in the nation that sells through direct salesmen—every deal—every product is rated in this big 200 page Guide that you as a salesman can't do without—rated as to selling power—profits to you. **ARE YOU GETTING THE BIGGEST COMMISSION POSSIBLE?** The **SALESMAN'S PRODUCT RATING GUIDE** tells you. How about a better side-line? What is the hottest selling deal today? Get the answer to these and a thousand more questions every salesman asks—**SEND NO MONEY**, just your name and address. **GUIDE** sent for no-risk examination. **FREE**, full details. Write **NOW!**
SALESMAN'S PRODUCT RATING BUREAU, Palm Desert 13, California.

Aim HIGH - Aim LOW!

You don't need a third hand with a Delta Reddylite. Hang it up. Set it down. Aim the 800-ft. beam anywhere! Uses 6-volt battery. See your dealer. Yours, less battery, for **\$3.50** only



Delta ELECTRIC CO.
Marion, Ind.

REDDYLITE 360° Swivel ELECTRIC LANTERN



x-acto®

HOBBY KNIVES and TOOLS

SEND 15¢ TO COVER POSTAGE FOR NEW ILLUSTRATED 28-pg. CATALOG
X-ACTO CRESCENT PRODUCTS CO. INC., 440 FOURTH AVE., N. Y. 16, N. Y.

DRAINS Cellars, Laundry Tubs; CIRCULATES Oil; IRRIGATES Gardens

Original "Type P" Pump has 2400 GPH capacity. 360 GPH 75" high, or 1500 GPH from 25" well. Use any 1/4 to 1/2 HP motor. DOES NOT CLOG. 1" intake; 3/4" outlet.

Only 38.95 postpaid if cash with order. (West of Mississippi, add 50c.)

Motor coupling included. MONEY BACK GUARANTEE!

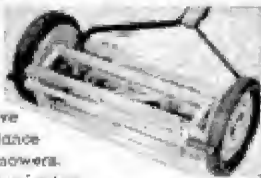
LABAWCO PUMPS, BELLE MEAD 7, N. J.



\$6.95

THE NU-WAY WEED CLIPPER

Eliminates hand cutting of dandelion stems and other weeds too high for your mower to cut. Attach a Nu-Way Clipper to your hand operated or power mower and do a clean job of mowing in one operation. Save time and work. Easy to put on and remove as needed. Order one today. Give make of mower, length of blades and inside distance between drive wheels. \$5.29 for 18 and 18 inch mowers. \$5.95 for 20 inch mowers. Ohio residents include 3% sales tax. NU-WAY CLIPPER. 658 South Washington Street



TIFFIN, OHIO

\$. \$. WANT TO SAVE GAS? . \$. \$

The Econo-Miser System on your car will give up to 1/4 more mileage. Easily installed complete with instructions \$3.00 postpaid. Money Back Guarantee.

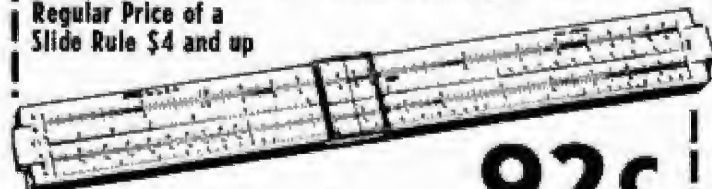
Send For Yours Today

Give make & year of car.

WILL GREEN - 6414 RADFORD ST., NO. HOLLYWOOD, CAL.

Say You Saw It in Popular Mechanics

Regular Price of a Slide Rule \$4 and up



Slide Rule

92c

and this coupon
Add 8c Postage

If you know how to use a pencil you can use a slide rule. For bookkeepers, accountants, salesmen (figuring commissions, cost, etc.), farmers, housewives, etc. For Armed Forces highly important. Men's most useful tool. Easy to calculate instantly. Multiplying, proportions, division, extracting roots, etc. "High Vision" Clear View Slide, Full 10" Rule, A, B, C, D, C1 and K scales. FREE 28-page instruction book on how to get correct answers instantly without pencil or paper.

Gene Loewy, 545 5th Ave., N. Y. 17

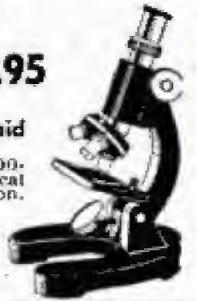
Dept. 143-C Limit three rules to each coupon

300-Power Import MICROSCOPE \$14.95

LABORATORY MODEL Postpaid

Triple revolving turret has 100, 200 and 300-power lenses! No frills, just excellent optical qualities, delicate adjustment, solid construction. Its quality and price astounded biology instructors. A lifetime bargain for students, schools, labs, research, amateurs. Anyone can now own one! Performance cannot be duplicated for \$75.00!

FEATURES: Fine micro adjustment, adjustable plano-convex mirror, Dove-tail hardwood case included free. If you are not amazed at its quality, send it back in 10 days. Your money refunded immediately. Send check, cash or M.O. for \$14.95 p.p.d. (Send \$5.00 deposit for C.O.D.'s) Free catalog. Money back guarantee.



Professional DISSECTING KIT \$4.95

FOR MICROSCOPIC SLIDE WORK IN BIOLOGY, BOTANY, ZOOLOGY

A special purchase for our microscope customers. The professional equipment in this complete kit is worth more than \$15—made to the specifications required by researchers and biologists. Ten pieces in fitted hardwood case: two fine steel scalpels, two prof. dissecting instruments, one magnifying glass, one special scissors, one special tweezers, three blank slides. Perfect for universities, doctors, students. Postpaid \$4.95.



\$9.95

Navy Type Mark XX
20 POWER TELESCOPE
\$30 value. Fine optically ground achromatic lenses, fully coated. Same power as standard artillery observers spotting scope. Precision all metal construction. Extends to 15 1/4 inches. Rust and salt-spray resistant. A valuable ship and boat owner's possession now at a price everyone can afford! Shipped in fitted hardwood case. Postpaid \$9.95.

Money-back 10-day guarantee on all items. Send check, cash or M.O. Free catalog on request or included with order. Calif. residents add 3% state tax.

20, 40, 60 Power Pocket MICROSCOPE



Select whichever power you want, then focus to pinpoint sharpness with spiral ring. Finest optics, amazing versatility. A compact new precision instrument for field study. Postpaid. **\$4.95**

AKRON 4400 SUNSET BLVD. OPTICAL DEPT. S-P
LOS ANGELES 27, CALIF.

PRECISION ANTENNA ALIGNMENT BY HAND!

SELECT-A-BEAM*—the extra-rugged, extra-low-cost, trouble-free TV antenna rotor that *always works*. ● **YOUR OWN SENSES** guide its quick, easy hand-operation for more precise alignment, better reception, at a fraction of any electric model's cost ● **NOTHING TO BREAK** or get out of order ● **WEATHER-SEALED** working parts factory-lubricated for life ● **ROTATES 360°** in seconds. Simple metering device ● **INSIDE OR OUTSIDE CONTROL**. Positions lock automatically ● **BALL BEARING SUSPENSION**. Long wearing bushings ● **ONLY 4 EXTRA POUNDS** on mast ● **LOW COST INSTALLATION**. All hardware furnished. You can put it up yourself. ● **AFTER 9-YEAR TEST** (equiv.) works like new ● **FITS ANY ANTENNA, ANY PURSE**. ● **ORDER BY COUPON BELOW**. Quick delivery.



\$12.95 NET
(U.S.A. Only)

SELECT-A-BEAM COMPANY

ERIE, MICHIGAN

Here is my check for \$12.95, for which please send me one SELECT-A-BEAM, the hand-operated TV antenna rotor.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

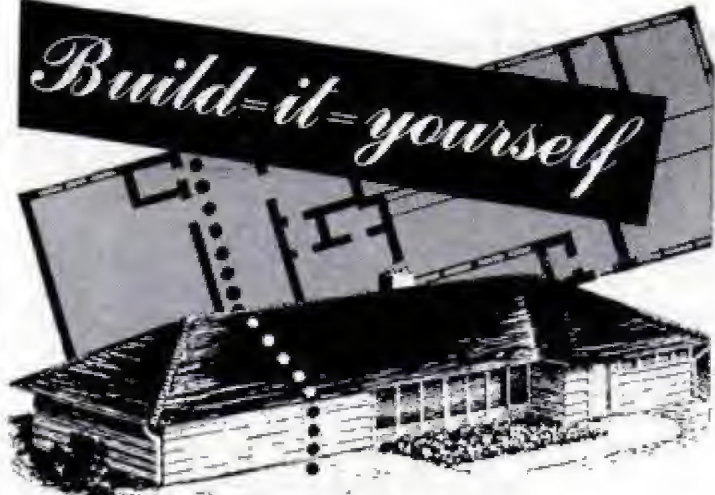
**THIS 17' 1" BOAT
STOWS INTO TWO BAGS
IN YOUR CAR TRUNK!**



UNSINKABLE "AERIUS", folding boat for sail, paddle, or motor, cruises anywhere—rivers, lakes, or ocean. No extra expenses for upkeep or maintenance required. Rugged hull has air tubes built in gunwales making it unsinkable—even a child can handle it. Sets up or demounts in 10 minutes for easy car, train, or plain travel. Easy to launch anywhere.

KLEPPER COMPANY, Dept. 605

1472 BROADWAY, N. Y. 18, N. Y.



**Popular Mechanics Famous
RANCH-TYPE HOUSE**

Save Thousands of Dollars by Building This Beautiful Home Yourself

Join the more than 100,000 families who have built their own homes in the past few years doing all or most of the work themselves and you can save more than 50% of usual building costs! Here is a dream home designed by the noted architect John J. Whelan, designer of the Drew Pearson home, especially for amateur home builders. You can build the basic five room unit for approximately \$5000. Carport may be converted into third bedroom and breezeway and garage added at your leisure. Basic house is to the right of the dotted line in the picture above; expansion is to the left. House fully expanded is 81 feet long and 29 feet wide.

Order Book and Plans — Save \$7000 to \$10,000

Book gives complete step by step instruction. Hundreds of pictures, photos and diagrams, showing every phase of construction, guide you from start to finish. Ten working size blueprints give floor plans, elevations, notes on construction, framing, lumber list, specifications, plumbing and wiring diagrams.

than he spends for material.

Order Book, Plans Now

Use the handy coupon below to order RANCH-TYPE HOUSE BOOK AND PLANS. Read the book; study the plans and then be prepared to go right ahead when you are ready to build. Even if you have the house mainly built by others you can enjoy a tremendous saving by using the instructions and blueprints.

Read How and See How — Simplified Instruction

You read "how-to-do-it" in the book and see how it looks in actual pictures. You follow the plans for dimensions. You make use of labor-saving kinks, special methods.

No Previous Building Experience Required

Any ordinary handy man, using simple tools, can build this house with little or no assistance. And at the same time, save more



Order on this Handy Coupon

**POPULAR MECHANICS PRESS, Dept. RH
200 East Ontario St., Chicago 11, Ill.**

Send at once my copy of the Ranch-Type House Book and Plans as checked below:

- Remittance enclosed Send C.O.D. (postage extra)
- Ranch-Type House Book \$ 3.50
- Set of 10 Blueprints 13.50
- Book and Blueprints 15.00
- Duplicate Set of Blueprints 5.00

Name _____

Address _____

City _____ Zone _____ State _____

**NOW! YOU CAN SAW
8 TIMES FASTER with . . .**



No. 445
"ARCO-SAW"

\$11.50 with
ALL GAGES &
"HYCARBON"
Crosscut
Blade.

SAVE TIME & EFFORT!

Toss away your old handsaw! Convert your drill in 1 minute to a rugged PORTABLE SAW. Whiz through wood, wallboard, plastic, etc. You'll be amazed how accurately "ARCO-SAW" rips, crosscuts, bevels, dados.

**FITS ANY
1/4" DRILL**

**CAN BE USED
WITH ONE HAND!**

**THE ONLY SAW WITH
PRECISION**

**GRADUATED GAGES:
Depth gage—0 to 1 1/4"
Bevel gage—0 to 45"
Adjustable rip gage.**

**Visual guide, RIGHT ANGLE GEAR
DRIVE, Safety-yoke,
CUTS 1 1/2" or 2x4 by turning over.**

No. 444 "ARCO-SAW"—Has same expensive features as No. 445—less gages **STILL ONLY \$9.95**
Depth-Bevel-Rip Gage for No. 444 "ARCO-SAW" . . . \$1.95
Extra Blades—4" Crosscut or 4" Combination . . . \$1.60

**UNCONDITIONAL
10-DAY MONEY
BACK GUARANTEE**

**START SAWING THE EASY WAY,
ORDER YOUR "ARCO-SAW" TODAY!**

DEALERS: Write
for nearest jobber.

Insist on "ARCO-SAW" at your dealer. If not available, send us check or M.O. (Postpaid). C.O.D.'s postage extra. Write for literature of other tools.

ARROW METAL PRODUCTS CO.

Dept. PM-5, 140 WEST BROADWAY, NEW YORK 13, N.Y.

Jet Power ... for your CAR

with the **ECON-O-MISER**

U. S. Agriculture's Exhaustive Tests (Bulletin AIC-240) show:

**Up to 30% mileage increase
More of engine's power utilized
Less Ping or Detonation**

By Water Alcohol Injection in high compression engines.

ECON-O-MISER is a scientific instrument of the diaphragm type, operating automatically by use of vacuum, injecting water and alcohol into the fuel system. Designed to help your motor attain its full power, speed and mileage. By Reducing—carbon, engine wear, ping on over-rotation. In all cases the results obtained might not prove consistent, therefore we urge you to take advantage of our 30 day money back guarantee.



ONLY
\$14.95

Send cash, check or money order—\$2.00 deposit required on C.O.D.'s.

Complete with tank, bronze injector, carburetor flange, hose and all fittings for easy installation.

ECON-O-MISER MFG. CO.

3019 Pico Boulevard, Santa Monica 1, California



NEW SAW SHARPENER

Improved #64 Hand Gummer sharpens all types circular saws 4" to 20" diam. Ideal for saw shops. Self-Centering adjustment for quick, easy set-ups. Complete with 1/4 HP motor, 1 grinding wheel & cord. \$79.50 FOB Portland, Wt. 70#. SEND FOR FREE LITERATURE.

P. T. HOBBS MACHINERY

8375 N. INTERSTATE AVE.

Dept. P.M.-61, PORTLAND 17, OREGON

Say You Saw It in
POPULAR MECHANICS

YES! SEND



directly
to my door
every month

I am enclosing

- \$3.50 for 1 year
 \$8.00 for 3 years

name _____

address _____

city _____ zone _____ state _____ A-52

Hand this order to your newsdealer or send it to

POPULAR MECHANICS
200 East Ontario St. Chicago 11, Ill.

Start a Business in Your Backyard



Earn **BIG MONEY**
MAKING
BUILDING BLOCKS

General Concrete Vibrator
BLOCK MACHINE
CAPACITY 1000 BLOCKS A DAY

Only **\$218** LESS MOTOR
F.O.B. PLANT

SHIPPING WEIGHT 400 LBS.



Here is a business you can start on small capital—in your own backyard—that earns 100 to 150% profit, with unlimited opportunities. Make concrete or cinder blocks. Millions used for homes, factories, public buildings, garages. Sell all you make to building trade. Do it with a General—and you're headed for success.

1000 BLOCKS A DAY

The General is a high speed, power-driven block machine at amazingly low cost. Rugged all-steel construction. Simple to operate indoors or outdoors. Makes superior 3 core type block meeting all code requirements. Produces up to 1000 blocks per day. Full operating instructions and mixing formulas supplied. Write for FREE details.

Dealer inquiries invited

Wonderful
Book Written
& Illustrated
by Experts



GENERAL ENGINES CO.

DEPT. M-52 • 307 HUNTER ST. • GLOUCESTER, N. J.

Includes floor plans for 6 beautiful, easy to build concrete block bungalows. Shows ways to save money. How to lay blocks, lay out building lines, mix concrete, build steps, porches and concrete floors. Mail coupon at once with \$1.

Name.....
Address.....
City.....Zone...State.....

SENSATION Electric
lawn mowing can...



"Like guiding a super-market cart!" That's how one owner describes the easy operation of a Sensation power mower. It makes good sense to get rid of the tiring, heart-straining work of pushing an old-fashioned hand mower. Switch to the new, light-weight quality-built Sensation Electric Mower with the famous whirling blade. With a Sensation, you'll mow grass carpet-smooth in half the time... with no need of raking. Yet your Sensation is sturdy enough to chop down tall weeds and brush. Find out now about the complete line of Sensation Electric and Gasoline Mowers. Mail Coupon today.

SEND FOR FREE BOOKLET TODAY

Please send me free your illustrated booklet describing the time-saving, work-saving, heart-saving features of quality-built Sensation Mowers.

NAME.....

ADDRESS.....

CITY.....STATE.....

SENSATION MOWER, INC., Box PM 5-52, Ralston, Nebraska

OVERHAUL YOUR MOTOR in 10 minutes



THE AMAZING MOTOR "RENEW" KIT

- INCREASES COMPRESSION
- STOPS PISTON SLAP
- STOPS OIL BURNING
- FREES VALVES, RINGS AND PISTONS

PREPARE NOW FOR SUMMER DRIVING!

RENEW WITH "COMPRESSION SEAL"

This proven motor treatment gives up to 15,000 miles of powerful, knock free performance to any car. Squeezed into cylinders, it forms a long wearing, lubricating seal by filling in worn places between cylinder walls and pistons. This increases engine compression, cuts oil and gas waste and eliminates the need of costly overhaul and ring jobs.

CLEANSE WITH MOTOR "PURGE" FORMULA!

Your engine will run smoother, cooler and more efficiently once flushed with Motor "Purge". When poured into cylinders it cleans, quiets and frees rings, valves and pistons from gums, carbons and varnish.

A MOTOR "RENEW" KIT TREATMENT REVITALIZES AND INCREASES THE LIFE OF ANY ENGINE!

FREE AUTO MANUAL WITH EACH ORDER!

Manual tells how to save gas, oil, brakes and tires through simple economy secrets . . . introduces many new products.

FULL 10 DAY "MONEY BACK" GUARANTEE! **\$6.95** Postpaid (\$1 C.O.D. deposit)

Kit treats all 4, 6, 8, cylinder cars up to 1947. 8 cyl. cars from '48 to '52 require a DUAL KIT, \$11.90 p.d.

CONSOLIDATED ENGINEERING, Dept. PMK-5
10407 W. Washington Blvd., Culver City, Calif.

Say You Saw It in Popular Mechanics

BUILD YOUR OWN POWER TOOLS - TILT/ARBOR SAW

Exclusive GIL-BILT Build-It-Yourself Features

- No machining—build easily with hand tools only
- No blueprint reading—step-by-step pictorial plans, full scale patterns, actual photographs
- Sturdy wood, aluminum, and steel construction
- Capacity and performance of commercial saws selling for \$80 and up

**BANDSAW
BELT SANDER
SAVE \$50.
OR MORE**

GIL-BILT 10-INCH TILTING ARBOR SAW



- 27x28 in. table, 13½ in. capacity in front of blade
- 10 in. blade cuts 2¼ in. deep, tilts full 45 degrees
- Floor model 34" high, table always stays level

- New Departure ball bearing arbor, ¾" precision shaft turned down for 5/8" bore blades, alum. housing, shipped ready to run
- Jackscrew and 4½ in. dia. handwheel lowers and raises blade
- Cast aluminum miter gauge and self-aligning rip fence guide

GIL-BILT Metal Parts Kit includes Plans, ball bearing arbor, miter gauge and bar, rip fence guide, dado insert, lock knobs, jack screw mechanism and handwheel, and all other metal parts (less blade) . . . **\$20.95**
Same Kit with 10" Combination Blade **\$24.95**
Same Kit with 8" Combination Blade **\$23.95**

GIL-BILT 12-INCH BAND SAW



- Cuts to center of 24 inch circle
- Handles stock up to 6 inch thick
- 18x18 inch table tilts 45 degrees
- Lower wheel and drive pulley runs on sealed New Departure Ball Bearings; Upper wheel runs on two 5/8" bore Oilite Bronze bearings.
- Upper wheel tension and tilt mechanism of cast aluminum, completely assembled.
- Upper and lower blade guides. Each has ball thrust bearing, self-lub bronze jaws
- Rigid cast aluminum wheels fully machined ready-to-install. Heavy rubber tires.
- Uses standard 78 inch blades up to 3/8 in. wide.
- Fully enclosed mechanism for utmost safety.

GIL-BILT Metal Parts Kit includes Plans, rubber tires, aluminum wheels, ¼ in. blade, ball bearing spindle, tilt mechanism, blade guides, table tilt segments, and all other metal parts . . . **\$21.95**

Return Kits in 10 days for refund if not satisfied.

(Prices include postage within 300 miles. Over 300 add 5%)
Also available—Plans and Parts Kit for Belt Sander and 8" Tilt/Table Saw. Order Plans at \$1.00 each—Send postpaid anywhere in the world or write for FREE descriptive catalog.

GILLIOM POWER TOOLS P. O. Box 1-PE, Lambert Field St. Louis 21, Missouri

Handy Mail Order List

Little Library of Useful INFORMATION

5 for \$1.00
12 for \$2.00
25¢ Each

Here at amazingly low cost is the practical help and information you have always wanted. Articles in Previous Issues of Popular Mechanics have been classified according to subject and are now available in these handy reprint booklets.

- | | |
|--|---|
| <p>How to Use Measuring Tools—
Micrometers, Calipers, etc.—
—108.</p> <p>Power Driven Saws—74.
Drill Presses, Grinders, Etc.—79.
Wood, Metal Turning—Lathes—81.
Filing Machine, Hack Saw, Cutoff
Wheel, Shaper—82.</p> <p>Lathe Tools You Can Make—101.
Workbenches—Tool Cabinets—47.</p> <p>Spray Painting—84.
From Pattern to Casting—91.
Tool and Saw Sharpening—92.
Sharpening Drills, Wood Bits—
90.</p> <p>Successful Wood Turning—32.
How to Read Blueprint—71.
Metal Turning Lathes—89.
Operating a Metal Lathe—100.
Heat Treating, Hardening—102.
Working With Glass—103.
Servicing Elec. Motors—75.
Electromagnets & Solenoids—44.
Transformer Construction—41.
The Boy Electrician—43.</p> <p>Soldering and Brazing—17
Arc and Spot Welders—5.</p> <p>Electroplating With Nickel, Chromi-
um, Cadmium, Etc.—86.</p> <p>Plating Leather, Wood, etc.—87.
Lower Your Fuel Costs—31.
Curing Leaky Basements—45.
Fitting Home Game Room—55.
Indoor & Outdoor Fireplaces—88.
Backyard Gardening—39.
Lawn and Garden Novelties—72.
Trellises, Pergolas, Fences—76.
Lawn and Garden Furniture—77.
Playground Equipment—73.</p> <p>How to Use Your Drill Press—125
Making Serving Trays—83.
Knots and Ropework—108.</p> | <p>Working With Plastics—61
Simple Home Improvements—104
Riding Home of Insect Pests—107
Children's Room Furniture—51.
Jigsawed Novelties—57.
Doll House & Doll Furniture—60.
25 Shelves You Can Make—64.
Novelties Turned on Lathe—82.
Inlay Pictures—Veneering—63.
Wood, Soap Carving—65.
Windmills & Weather-vanes—68.
Lamps from Wood, Metal—69.
Rustic Furniture—18.
Wood Finishing—40.
How to Fix Electrical
Appliances—111
Painting Your House—117
Build Your Own Relays—123
Rowboats, Small Dinghy—83.
Small Sail Boats—84.
Two Outboard Runabouts—85.
Build Own Canoe, Kayak—30.
Build Class-B Ice Yacht—22.
Auto Kinks, Shortcuts—10.
Lawn and Garden Equip-
ment—124</p> <p>Motor-Driven Midget Cars—34.
Stop Auto Elect. Troubles—95.
Photo Printers and Dryers—25.
Photo Darkroom Equipment—56.
Trick and Table Top Photos—97.
Home Movie Equipment—118
Poultry Houses—108.
Guns and Decays—109.
Re-Silvering Mirrors—70.
Chemical Experiments—93.
Log Cabins, Tourist Houses—14.
Using Basic Tools—120
Farm and Garden Tractors—8.
Building Extra Attic Rooms—23.
Attractive Basement Rooms—24.</p> |
|--|---|

- | | | |
|--|--|---|
| <p>Sanders—60.
House Wiring—89.
Hanging Wallpaper—
—38.</p> <p>Built-in Fixtures—78.
Bird Houses—7.
Magazine Racks—49.
Clock Cases—50.
Book Ends—82.</p> | <p>Small Tables—54.
Smoking Stands—56.
Decks—58.
Book Cases—59.
Action Toys—66.
High Flying Kites
—67.</p> <p>Telephones—20.
Metal Craft—28.
Small Looms—37.</p> | <p>Gem Cutting—42.
Photo Enlargers—1.
Photo Kinks—98.
Cleaning Formulas
—11.
Taxidermy—9.
Photo Lighting—110
Training Dog—36.
Small Furnaces—36.</p> |
|--|--|---|

Check Titles Wanted, Clip, Mail with Remittance to

POPULAR MECHANICS PRESS, Dept. 23, 200 E. Ontario, Chicago 11

Build this Beautiful LAWN FURNITURE YOURSELF

NO EXPERIENCE NEEDED

Smart Exclusive Styles By John Bergen
... Four Big Plans Drawn to Scale ...
Complete Material List

Now with just a few spare time hours and some inexpensive materials you can build gay comfortable lawn furniture that will make your garden more attractive . . . more comfortable and more fun this summer.

No need to pay a small fortune for lawn furniture when you can build your own and save over 50% of what it would cost you already built!

Popular Mechanics four big drawn-to-scale plans show every step to follow. Complete material list tells you just what sizes of wood to buy so there will be no waste.

Make your lawn and garden the finest and most attractive on your block by building this smartly styled furniture. Enjoy real comfort during those hot summer months by making your garden your outdoor living room. Send today for your plans and material list. Complete set of four plans only \$2.00. Complete satisfaction guaranteed or your money refunded.

POPULAR MECHANICS PRESS

200 E. Ontario St. Chicago 11



PROTECT

THE HOME YOU BUILD
AND
SAVE MONEY TOO!

USE NEVER-STAIN

ALUMINUM NAILS

- RUST PROOF
- ECONOMICAL
- SAVE PREMATURE PAINTING
- FHA APPROVED
- LAST A LIFETIME

WRITE
DEPT. PMS
FOR FREE
SAMPLES

NICHOLS

WIRE & ALUMINUM CO.

DAVENPORT, IOWA

WORLD'S LARGEST MANUFACTURER OF ALUMINUM NAILS

New POWER MOWER

FREE Building Instructions
Write For Them

Amazing invention makes whirling blade mower pull and steer itself as well as cut grass and weeds. Convert your mower or build a complete mower with screw-driver & pliers. Send name and address. Postcard will do.

PULLS ITSELF, STEERS ITSELF

Convert Your Mower Or Build A New One

T & H Mfg. Co., Dept. 0115, 811 E. 31 St., Kansas City, Mo.

Spindle—Platform—Wheels—Fork—Handles—Driving & Steering Parts
All parts available—Kit or separately.

BARGAINS

Brand New, top quality glasses. All have precision ground optics, durable lightweight bodies, moisture and dust proofed. Bear the UNITED Seal of Quality, your guarantee of satisfaction. Achromatic! Coated! Featherweight

16x50 COATED \$69.50

The ultimate in a fine binocular. Tremendous power. Featherweight (weighs only 25 ounces). Precision made in every detail. COATED providing sharper, brighter images. Individual focus. Objective lens is 50mm (2 inches) across!

All are COATED!

6x15	4 oz. Pocket	\$16.95
7x18	Pocket. ALL CHROME	18.95
8x30	16 oz. Economy	27.95
7x50	31 1/2 oz. Sharp, bright. Bargain	36.00
7x50	Center Focus. Sale priced	39.50
8x30	17 oz. Clear, crisp	32.50
8x30	Center Focus	37.50
10x30	18 1/2 oz.	39.50
10x50	35 oz. More Power	62.00
12x50	35 oz. Reaches out	65.00
12x50	Center Focus. 25 oz.	67.50

GERMAN WORLD'S LIGHTEST

Made in GERMANY, optical center of the world! COATED. Whisper Weight! CENTER FOCUS, prismatic binoculars with individually focusing right eye piece. Follow moving objects faster, easier. Enjoy clearer, sharper, brighter images.

8x30	4"x5 1/4" 11 Oz!	\$39.50
7x35	5"x6" 14 Oz!	57.50
20x56	8 1/2"x6 1/4" 27 Oz!	99.50

SIX TELESCOPES IN ONE!

\$30.75 COATED

15 to 40 POWER

American made Wollensak telescope. Instant focusing at 15x, 20x, 30 and 40x, etc. Turn power tube to click—no guess work. Telescope measures 9" closed, 27" when extended. Weighs only 18 oz. Has rust proof chrome tubes, large 40mm objective lens. All 12 optic surfaces are COATED. See 22 bullet holes clearly at 300 feet. Use also for astronomical observation. \$30.75 price includes tax and fine leather case.

UNCONDITIONALLY GUARANTEED. Try for 30 days at our risk! If not fully satisfied return for full refund! Cash orders rushed postpaid. On C.O.D.'s include \$2.00 deposit. Add Federal Tax. Prices on all of above include handsome genuine leather case and straps. DEALERS—WRITE FOR 24 PAGE WHOLESALE CATALOG.

UNITED BINOCULAR CO.

9043 S. Western United Bldg. Dept. ARF-4408 Chicago 20
Display Sales Rooms open 9:00-5:30 Mon. thru Fri.

MAGNETS

LIFT 225-lb.

AMAZING PERMANENT MAGNETS — WILL NOT WEAKEN! NON-ELECTRIC. Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from floor sweepings. Clear alley of harmful lumps, nails. Many other uses listed. Pays for itself quickly. GUARANTEED: Try any magnet one week. Money refunded if you are not well-pleased.

No. M-725	(Weights 24 Oz.) Has a pull of 225 lbs. on a steel block	\$15.00
No. M-675	(Weights 49 Oz.) Has a pull of 175 lbs. on a steel block	\$10.50
No. M-650	(Weights 41 Oz.) Has a pull of 150 lbs. on a steel block	\$ 8.50
No. M-550	(Weights 14 Oz.) Has a pull of 50 lbs. on a steel block	\$ 4.00
No. M-530	(Weights 8 Oz.) Has a pull of 30 lbs. on a steel block	\$ 3.00
No. M-30	Hobbyist assortment of six small magnets	\$ 1.50

Send Money Order or Check. We pay postage. No C.O.D. Shipments.
MIAMI MAGNET CO., 3240 N.W. 27th Ave., MIAMI 42, FLA.

New MOTOR BARGAINS for Home, Farm & Industry

ALL NEW MOTORS WITH ONE YEAR FACTORY GUARANTEE

All are 110 V. or 110/220 V. 60 cy. 1 ph. A.C. Motors.
Write for FAN CIRCULAR: Listing Blades, Guards, Motors, ALL SIZES: Atlic, Window or Room Cooler

1/3 H.P.	Delco: 1750 RPM—Ind. Type	\$14.75
1/3 H.P.	Dayton: 1750 RPM—Double Shaft	\$18.75
1/3 H.P.	Dayton: 1750 RPM—Capacitor	\$22.50
1/2 H.P.	Westinghouse—1750 RPM—Dbl. Shft.	\$22.50
1/2 H.P.	Westinghouse—3450 RPM—Dbl. Shft.	\$23.50
1/2 H.P.	Dayton: 3450 RPM—Induction Type	\$18.50
1/2 H.P.	Dayton: 1750 RPM—Capacitor	\$32.50
3/4 H.P.	Gen. Elec.: 1750 RPM—Double Shaft	\$34.50
3/4 H.P.	Dayton: 3450 RPM—Capacitor	\$34.50
1 H.P.	Dayton: 1750 RPM—Capacitor	\$52.00
1 H.P.	Dayton: 3450 RPM—Capacitor	\$52.00
1 H.P.	Dayton: 3450 RPM—Double Shaft	\$59.00
1 H.P.	Dayton: 1750 RPM—Capacitor	\$67.50
1 H.P.	Dayton: 3450 RPM—Capacitor	\$62.00
1 1/2 H.P.	Dayton: 3450 RPM—Double Shaft	\$67.50

Above Special Prices are F.O.B.

C. MARSHALL SALES,
3546 W. Fullerton Ave., Dept. P-5, Chicago 47

16 to 1 SPEED REDUCERS

For Display Table — Barbecue Spits — Toy Auto Gear Box — Experimental Uses, Etc. Gears Enclosed in Aluminum Housing. Bronze Gear, Hardened Worm, Input Shaft 1/4 in. Output Shaft 3/8 in. Speed Reducer $\pm R$ 161...\$3.95 Paid

General Utility Motors

Shaded Pole Motor, brushless. Non-Radio, T.V. Interfering. 110 V.-60 cy. A. C. Speed 1550 RPM for light machine duty, exhaust fans, furnace fans, blowers and many practical and experimental purposes. Handles fan blades from 12 to 20 inches.

UM-40	1/40th H.P. Postpaid	Only \$6.25
UM-30	1/30th H.P. Postpaid	Only \$7.50
UM-20	1/20th H.P. Postpaid	Only \$8.75
UM-15	1/15th H.P. Postpaid	Only \$9.75

FAN BLADES TO FIT THE ABOVE RESPECTIVELY

12 inch blade	Only \$1.50
14 inch blade	Only \$2.75
16 inch blade	Only \$3.75
20 inch blade	Only \$4.75

(all above blades are Postpaid)

Three Speed Motor Control for above motors
#1X-474...Postpaid...Only \$4.25

Volume Blowers for Heating, Ventilating, Exhausting

Blowers for forced drafts, heating boosters, exhausters, coolers, dryers and dust collectors, 110 volt A.C., 50/60 cycle motors.

*Midget Blower: 5 CFM 2 in. Wheel	\$ 5.95
*50 CFM Blower: 3 inch Wheel	\$ 9.75
*75 CFM Blower: 4 inch Wheel	\$11.25
*250 CFM Blower: 5 inch Wheel	\$22.50
600 CFM Blower: 6 inch Wheel	\$38.50
1000 CFM Blwr: 8 inch Wheel	\$52.00
1500 CFM Blwr: 9 inch Wheel	\$72.00

*These Blowers with Motors shipped Post Paid. Larger sizes are F.O.B.

IF ELECTRIC SHAVERS
CAN'T TOUCH YOUR BEARD
YOU NEED A



THE SHAVER
THAT SHAVES
ANY BEARD

Whisker's clipper-type .002" thin blade shaves any length beard, even to 7 days' growth, without pulling or stalling. 110v AC model; no TV or radio interference! See your barber or dealer. If he cannot supply you, send \$15.95—we pay postage; or send \$2, you pay balance plus postage and C.O.D. 10-day money-back guarantee.



CADET ELECTRIC HAIR CLIPPER

Cuts hair, removes superfluous hair from legs and under arms. The same fine quality clipper used and sold in many beauty shops. See your shop, or dealer. If you prefer, send \$10.95—we pay postage; or \$2, you pay post-man balance, postage and C.O.D.

ELECTRO TOOL CORP., Dept. W522-E, Racine, Wis.

**It's a cinch to
Install!**

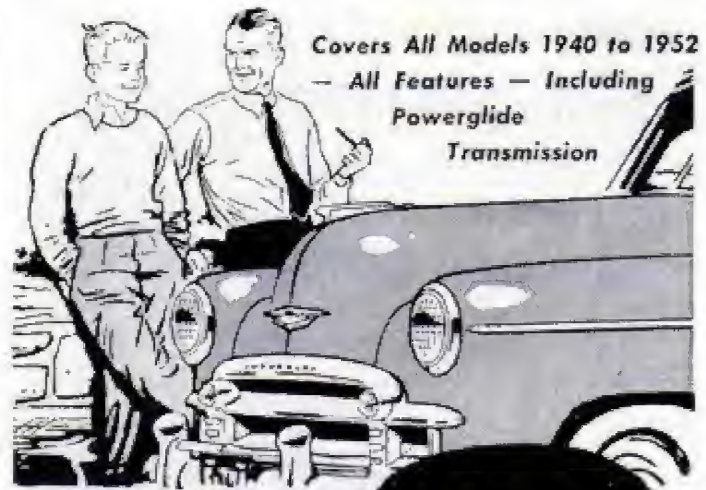


**Combustioneer®
AUTOMATIC
HUMIDIFIER**

A few dollars, your own tools, a couple of hours will give your home all the benefits of healthful, protective *automatically humidified air!* Yes, in your *present* warm-air furnace—coal, gas or oil! No plumbing necessary!

Exclusive Combustioneer features... Twin-Valves of stainless steel, can't rust, corrode or leak . . . "Noverflow", prevents water dripping *inside* furnace . . . big "Thirsty-Thick" ceramic plates for larger water evaporation area . . . Selector Dial for positive humidity control . . . Water pan of heavy non-corroding metal.

Low Prices! Model CH-300, 4 plates for 13" to 20" plenum (width or length), \$20. CH-200, 6 plates for 22" to 25" plenum, \$22, F.O.B. Springfield, Ohio. Prices include 10 feet of tubing, saddle valve and adjustable hinge face plate. Immediate shipment. Check or Money Order. **Combustioneer DIV., THE STEEL PRODUCTS ENGINEERING CO., 1212 W. COLUMBIA STREET, SPRINGFIELD, OHIO**



Covers All Models 1940 to 1952
— All Features — Including
Powerglide
Transmission

Get the NEW
Popular Mechanics
Owner's Manual

If you drive a Chevrolet—any model—1940 to 1952—get this new owner's manual today. It will save you money on repairs and service; give you safe, economical and trouble-free motoring and protect your investment in your Chevrolet by keeping it constantly at top value. Can easily be worth hundreds of dollars to you in a single year.

**Chevrolet
Owners**
Spend Less to Own
and Drive Your Car

**Official, Authoritative
Bumper to Bumper
Information**

Prepared by a noted automotive authority and Popular Mechanics editors with the full cooperation of Chevrolet engineers and service specialists. Covers all phases of Chevrolet operation, service and maintenance. 304 pages of practical information and hundreds of photos, diagrams, charts, and sectional views, make every part, every operation, easy to understand. Complete index enables you to put your finger on the information you want instantly.

Prevents Costly Repairs

Explains everything about your car; what can go wrong; how proper adjustment and servicing should be done; how to prevent major troubles and costly repairs later on. Even if you don't service your car at home the manual will save you important money on every day operation.

Mail Coupon Today

Mail coupon now. Send only \$3.50 for prepaid delivery or you can pay postman, plus charges. See money back guarantee in coupon.

Learn All About Chevrolet's Powerglide Automatic Transmission

Know Your Chevrolet Valve-in-Head Engine and How It Operates

Understand Chevrolet's Center Point Steering and Unitized Knee-Action.

Protect Your Investment. Know Your Chevrolet.



**POPULAR MECHANICS PRESS
200 East Ontario St., Chicago**

Send Manual for Chevrolet Owners at once. If not satisfactory I will return it within 5 days and you will refund full purchase price.

Remittance for \$3.50 enclosed. Send C.O.D.

Name _____
Address _____
City _____ State _____

Kill Weeds **AUTOMATICALLY** as you Mow with Sensational **LAWN FAIR** Mower Attachment!

Mounts on lawn mower handle; feeds 2,4-D to mower roller which distributes weed killer over susceptible weeds . . . evenly, effectively, without harmful "drift" or waste. No pumps or friction parts. Fool-proof! Fits all 16"-24" reel-type hand or power mowers. Only \$14.95, complete, direct from factory to you, by check, money order, or send \$1. balance C. O. D. **YOUR MONEY BACK IF NOT SATISFIED.** Order yours today. Be sure to specify mower cutting width.

Also used for applying liquid fertilizer to your lawn.



Only **\$14.95**
Exclusive product of:
RED-E TRACTOR CO.
RICHFIELD, WISCONSIN

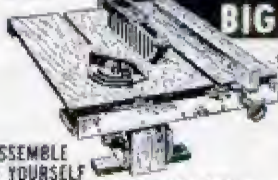


SPORTONE MUFFLERS

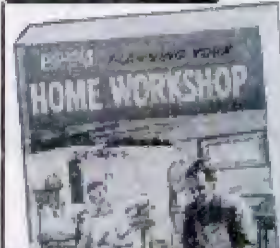
Ford & Chevrolet.....\$ 4.45
All other popular cars..... 5.45
V-8 Dual Sets..... 15.95
Chromed Silentips..... 2.95
(Please state make & year of car on all orders.)
SANDEE MUFFLER CO.
5643 Corryna Place • Culver City, California

POSTPAID ANYWHERE IN U.S.A.

WE FURNISH ALL MACHINED METAL PARTS, EVERY SCREW, NUT, BOLT, WASHER, AND COMPLETE PLANS FOR THIS . . .



BIG 10" POWER SAW
\$10.95 FULL REFUND IF LESS GUARD & WOOD NOT SATISFIED IN 10 DAYS
COMPLETE PLANS 10c
MARCUS-POLLAK
DEPT. N, ROYERSFORD, PA.



HAVE A BIGGER — MORE EFFICIENT HOME WORKSHOP

Popular Mechanics PLANNING YOUR IDEAL WORKSHOP shows you how to make use of every inch of space in your workshop; detailed floor plans, wiring layouts and power tool hookups plus actual photographs of famous home workshops you can use as models. Save money by building your own shop furniture. Special Where-to-Buy-It Guide, 451 Illustrations, Cloth Bound, Working Diagrams. Order your copy today from **\$2.50**
POPULAR MECHANICS PRESS
200 E. Ontario Street Chicago 11



MAKE BIG MONEY!

Be a floor surfacing contractor and sand both new and old floors. Sanders are easy to operate and better still, you're your own boss. Write for latest "sell-all" booklet entitled "Opportunities in Floor Surfacing", enclosing 25 cents in coin or stamps to cover handling.

AMERICAN FLOOR SURFACING MACHINE CO.
523 So. St. Clair Street • Toledo 3, Ohio

HELPFUL BOOKS

Send post card asking for FREE catalog
Popular Mechanics Press, 200 E. Ontario, Dept. 601, Chicago 11

NEW SENSATIONAL LOCKING ELECTRIC CORD PLUG

- KEEPS PLUG AND CORD IN PLACE
- PREVENTS CHILDREN FROM PULLING PLUGS FROM RECEPTACLES
- WILL SAVE MANY EXPENSIVE SERVICE CALLS CAUSED BY LOOSE OR PULLED PLUGS

3 Plugs . . . Only \$1.00 POSTPAID

JERO SALES CO. 871 PAYNE AVE. DEPT. B ST. PAUL 1, MINN.



BOSS

WYTEFACE*



STEEL TAPES



\$4.90 for 50'
\$7.95 for 100'

1. Wide sweep winding handle
 2. Convenient finger grips
 3. Genuine WYTEFACE steel tape
- Prices slightly higher in the West
*Trade Mark

KEUFFEL & ESSER CO.
Est. 1867

NEW YORK • HOBOKEN, N. J.
CHICAGO • ST. LOUIS • DETROIT • SAN FRANCISCO
LOS ANGELES • MONTREAL

The NEW Model 50 UTILITY TESTER FOR REPAIRING ALL ELECTRICAL APPLIANCES-MOTORS

an all-around electrical trouble shooter



- Measures A.C. and D.C. Voltages, A.C. and D.C. Current, Resistances, etc.
- Will measure the current consumption while the appliance under test is in operation. The appliance or utility may be plugged directly into the front panel receptacle. A special pair of insulated clip-lead leads is included for motors, etc.
- Incorporates a sensitive direct-reading resistance range which will accurately measure all resistances commonly used in electrical appliances, motors, etc. This range will enable continuity checks and tests for shorts and opens.
- Will test thermostats, radio tube filaments, bulbs, fuses, fluorescents, condensers, switches, field coils, circuit breakers, lighting systems, etc.

Handsome round cornered molded bakelite case 3 1/8" x 5 7/8" x 2 1/4". Complete with all test leads and instructions.

\$13.90

SOLD ON EASY PAYMENTS AT THE NET CASH PRICE

No interest or carrying charges added. Simply remit \$3.90 with order, pay balance, \$2.00 per month for 5 months.
SUPERIOR ELECTRONIC CO., INC.
Dept. B-64 • 227 FULTON STREET • NEW YORK 7, N. Y.

FAST, SMART & SNAPPY

FOLBOT

FOLDS IN TWO LIGHT BAGS

Paddles • Outboards • Sails

Versatile, stately, streamlined craft; wide beam, large decks, low center of gravity for sturdy performance with greatest safety record. Weighs only 65 lbs.—loads 750 lbs.—3 people and gear. One person can handle it. Easily packed and stored, fits inside car trunk. Wonderful for cruising, hunting, fishing in open seas, surf, rapids, or rocky waters. Rock resistant and leak-proof. No upkeep or fees.



Set up in a jiffy. No tools required.

BIG CRAFT
NOW ONLY

\$134

and up

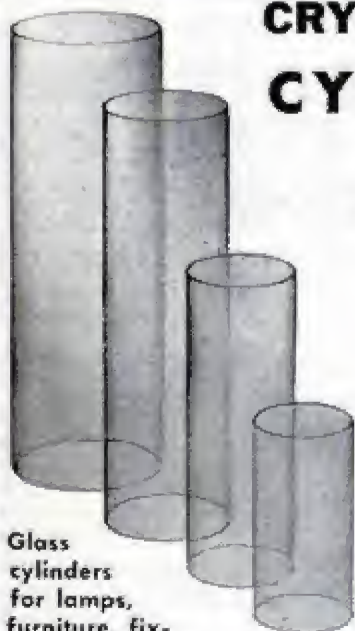
Since 1933, thousands of enthusiastic Folbot users.

FREE

giant illustrated catalogue. Write today: FOLBOT 42-09 Hunter St. Long Island City 1, N. Y.

CRYSTAL GLASS CYLINDERS

SIXTY-FIVE SIZES
CARRIED IN STOCK
FROM 1 1/4" TO 14"
DIAMETERS



Glass cylinders for lamps, furniture, fixtures, and many other applications for hobbyists and manufacturers. Send 25c for catalogue of 65 stock sizes. In any quantity, large or small.



Dunbar Glass Corporation

DEPT. PM-1

DUNBAR, WEST VIRGINIA

NEW!

ALL ABOUT TELEVISION



Service Your TV Set Yourself and Save Hundreds of Dollars . . . Save on the Purchase of a New Set!

Here's the brand new book that tells and shows you how 9 times out of 10 you can service your TV set yourself and save the \$5 to \$25 fee charged by professional repairmen for service calls.

Here are famous step-by-step instructions by John Derby, famous television engineer, which make it possible for you to locate trouble quickly and repair it in the matter of minutes. Hundreds of "show-how" photos, drawings and diagrams actually show you just how to go about making most TV repairs.

A special illustrated section contains actual photographs of imperfect TV pictures. By comparing the picture on your set with those in the book you immediately identify the trouble and then by following Derby's instructions you make the adjustment or repair which will give you perfect reception once again.

Find out how to install your own antenna at a savings of as much as \$20 . . . how to replace burnt-out picture tubes . . . how to get the best reception in outlying areas . . . how to save money when buying a new set . . . what to look for when you purchase a TV set.

Go with Derby into TV studios and see stars in action . . . see how television shows are produced and what goes on "behind the scenes."

No other TV book on the market is so comprehensive and so chock-full of valuable information. No other book can save you so much money.

Send just \$3.00 for your copy of "All About Television." Read it for seven full days and unless you agree that it can save you hundreds of dollars and enable you to service your TV set yourself just slip it back in its wrapper and return it to us for a full refund. Use the handy order blank today.

Order on this Handy Coupon

POPULAR MECHANICS PRESS
200 E. Ontario Street, Chicago 11, Ill.

Remittance for \$3.00 enclosed. Rush postpaid my copy of "All About Television." Unless it is entirely satisfactory I may return it within seven days for a full refund.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Send C.O.D. (Postage extra)

POPULAR MECHANICS

AIRPLANE WHEEL ASSEMBLIES

These wheel assemblies are all new, and of heavy duty construction. Depending on load desired to carry, they are ideal for House Movers, Farms, Trailers, Carts, Wheelbarrows, etc.

Complete with Wheel, Tire, Tube and Bearings



Size 20:00, 10 ply tire, smooth tread, uses tapered axle size 3 in. x 2 1/2 in. 10 1/2 in. wide. Overall height 24 in. Static Load 6,000 lbs. Weight 54 lbs., Price \$47.50 ea.
 Size 22:00, 8 ply, smooth tread. This size complete with axle. Overall height 22 in., axle width 10 in. Static Load 4,700 lbs. Weight 70 lbs., Price \$37.50 ea.
 Size 24:00 x 4, 4 ply, smooth tread. Uses straight 1 1/2 in. axle, 6 in. wide. Overall height 17 in. Static Load 900 lbs. Weight 13 lbs., Price \$27.50 ea.

Size 17:00, 6 ply, smooth tread. Uses tapered axle, size 2 in. x 1 3/4 in. 8 in. wide. Overall height 17 in. Static Load 2,000 lbs. Weight 18 lbs., Price \$17.50 ea.
 Size 23:00 x 4, 6 ply, smooth tread. Uses straight 3/4 in. axle. 3 3/4 in. wide. Overall height 13 in. Static Load 1,800 lbs. Weight 8 lbs., Price \$12.50 ea.
 Size 10 1/2 x 4, 6 ply ribbed tire. Uses straight 3/4 in. axle, 3 3/4 in. wide. Overall height 10 1/2 in. Static Load 1,200 lbs. Weight 8 lbs., Price \$9.95 ea.

Prices F.O.B. Chicago. Include approx. postage on orders paid for in advance. C.O.D. orders enclose 25% balance sent C.O.D.

U. A. S. Corp. Dept. PMS, 5637 W. 63rd Pl. Chicago 38, Illinois


INVENTOR'S CORRESPONDENCE KIT

No Agents! No Attorneys Fees!

This kit includes authentic instructions on THEFT-PROOFING; & the writing of business letters that SELL, with sample correspondence as guides. Also specially imprinted bond paper & envelopes, tracing paper for your sketches, supply list, and CONFIDENTIAL LISTING of BUYERS, including over 100 MANUFACTURERS. All this for only \$2 from:

INVENTOR'S SUPPLY HOUSE, Box 1118M, Newark 1, N. J.

ELECTRIC MOTOR BARGAINS!

	1/2 HP	1750 or 3450 RPM	1975	1 HP	3450 RPM	3900
	1 1/2 HP	3450 RPM	4750	2 HP	3450 RPM	6500

All prices F.O.B. Immediate Delivery

Every Motor Fully Guaranteed

Heavy Duty, Regulation Induction and Capacitor Types, 110-220 Volts, 60-cycle, Single-phase. Standard Makes G. E., Wagner, Leonard, Westinghouse, etc. Rush your order TODAY—large stock of motors—1 & 3 phase, 32-v. direct current bargains also.

ROBERTS ELECTRIC CO., 849 W. Grand, Dept. 6, Chicago

CHEVROLET OWNERS

STOP ON A DIME!

New Conversion Kit Doubles Chevrolet Braking Power. Easy 30 minute installation of this new kit converts present brakes to powerful "Bendis" type as fitted on Cadillac, Oldsmobile and Buick cars. Kit consists of 4 brake energizers which replace original anchor pins on all 1936 thru 1950 Chevrolets. Guaranteed for the life of your car. Only \$3.75 postpaid.

NEWHOUSE AUTOMOTIVE INDUSTRIES

Dept. 8C-5, 5805 E. Beverly Blvd., Los Angeles 22, Calif.

Make Money SELLING Eshelman Tractors and doing GARDEN WORK

AXLES FLOWS CULTIVATES HARROWS HAULS SPRAYS SAWS DOZER MOWS CUTS ROLLS TILLS SNOW FLOW

ESHELMAN

FOR BETTER

LAWNS

and GARDENS

also POWER MOWERS

and RIDING TRACTORS

Women can operate it.

Also Power Reverse Free Catalog. Write ESHELMAN, Dept. 309 118 Light St., Balto 2, Md.

1 1/2 to 3 HP FROM \$95 PLUS TOOLS

SAY YOU SAW IT IN POPULAR MECHANICS

FOR FLY FISHERMEN ONLY

IMPORTED HAND-TIED FLY HOOKS

Mounted on protective cork strips and made of the finest "Mitako" steel. Twelve popular patterns packaged in a beautiful "Paulownia" wood box.

Send for free catalog on OTHER fishing needs.

MINNESOTA FISHING TACKLE CO. BOX 644-M MINNEAPOLIS, MINN.

Get 'em today . . . Only \$1.50 a box, post-paid (twelve assorted flies to a box). Cash or check . . . C.O.D. extra.

NEW!



- and only 50¢

20 original projects . . . drawings, photos, step-by-step instructions . . . tips on joinery, gluing, finishing . . . send \$30 cash (no stamps) per copy, \$65 outside U.S.A. Limited first edition, order today.

ATLAS PRESS COMPANY

Atlas 543 North Pitcher Street, Kalamazoo, Michigan
 DEPENDABLE QUALITY TOOLS SINCE 1911

"Made it myself" and saved over \$3300



this beautiful comfortable \$50 OTTOMAN

cost me only \$16.75

Now you can afford this beautiful OTTOMAN of top-quality materials and design, seen only in finest homes. Make it yourself with EASTERN'S exclusive DO-ALL KIT and SAVE! KIT contains hard-wood frame, springs, rubberized hair, etc., and choice of beautiful tan, maroon, grey or blue fabrics. The easy-to-follow ILLUSTRATED INSTRUCTION manual—over 60 photos—makes it amazingly simple. Friends will clamor for one . . . Cash in on its popularity and start a profitable business at home. Send only \$16.75 for complete KIT and INSTRUCTIONS. MONEY-BACK-GUARANTEED. Shipped express charges collect. Order one today—now.

EASTERN SCHOOL OF UPHOLSTERY
 DEPT. M 555 BROADWAY, NEW YORK CITY

BUY from C&H
you'll save and be sure

HUNDREDS of SENSATIONAL BARGAINS! HOT ROD SUPERCHARGER

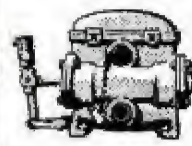


Extra soup and go at a price you can't afford to miss! Mfr'd by Borg-Warner. Specifications: 7 1/2" deep, 7" high, Wgt. 17 lbs. Compact and sturdy, 4 base mounting holes, 3/4" outlet, 3/8" shaft with female Lovejoy coupling. Priced today at \$85. Our special SALE PRICE \$31.00



Surplus Aircraft Recognition Slides
 Air Force aircraft recognition slides. Fighters, bombers, etc. Boxes of Jap. German, British and American planes. Introductory offer of 25 slides. Only 98c, 60 slides for \$1.95. With orders of 100 slides at only \$2.95 we send you a pocket size Mini-Viewer worth \$1.25 FREE!

BRASS HAND PUMP



Double acting—pumps on forward and return strokes. Capacity 1000 gal. per hr. \$48. value, only \$18.50



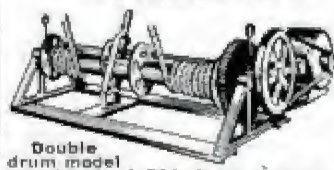
ALARM HORNS
 and Sirens, 110 v. AC motor driven. Heavy duty with long life and adjustable tone—high, med. and low. List \$47. NEW \$19.95

LIGHT PLANTS

300 Watt 110-220 volt AC. Wgt. 40 lbs.—portable \$99
 750-1000 Watt 110v. AC Briggs & Stratton eng. \$169
 1000-1200 Watt 110 v. AC only \$194.00
 2500-3000 Watt 110 v. AC Slow speed (1800 rpm) Leland generator for longer life. Recondition and fully guaranteed \$295. NEW \$345
 Plants built in 1951 with tools & spare parts, \$426
 5 KW Plant. 120 volts, 60 cycle AC. List \$675.00, NEW \$1910.00. Used \$675.00. NEW. Your price only

\$895.00

SENSATIONAL WINCH VALUES



Double drum model WINCHES, 1,500 lb. capacity, Hand operated \$12.95
 WINCHES, Hand operated half bearing model, 1500 lb. cap. 3-1 ratio, hand brake. Two speeds \$39.50
 WINCHES, 3,000 lb. double drum, Hand operated, . . \$49.50
 WINCHES, 1,500 lb. capacity, Electric drive \$109.50
 WINCHES, 3,000 lb. capacity, Electric drive \$188.50
 CABLE, 1/2" preformed stainless steel aircraft; 100 ft. or less, 17c per ft.; over 100 ft., 15c per ft.

54 to 1 BOSTON Speed Reducer
 Reduces speed of ordinary 1750 rpm electric motor to 33 rpm. Lists at \$55.00. Our price \$29.50

80-1 ratio Gear Reducer
 Double reduction, reduces 1/8 to 1/32 HP electric motor's 1750 rpm to 22 rpm. Reg. \$43.00, NOW . . . \$22.00

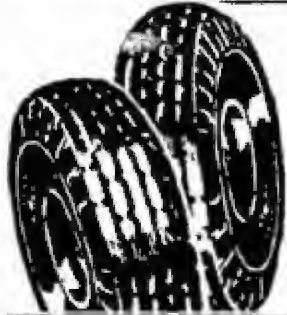
RUBBER HOSE
 Long wearing GOOD-RICH 2 ply 2" I. D. 25 ft. lengths worth \$25. Only \$4.95. 11 lengths for \$12.00

SEND TODAY FREE CATALOG

Hundreds of \$\$ saving buys. These are a few of the many items at sensationally low prices!

Pumps Grinders Drop Cords Generators Fire Pumps Saws Clutches Air Tanks

C&H ELECTRIC MACHINE Co. Inc.
 4347 W. Juneau Ave., Milwaukee 3, Wisconsin



TUBE GIVEN WITH EACH PASS. & TRUCK TIRE

18 MONTHS WRITTEN GUARANTEE
 Sent with Every Tire You Buy

SEND THIS AD IF YOU WANT
 discount on every tire.
10% SAVE TIME
SAVE MONEY

GOOD USED TIRES "Not recapped."
 18 YEARS AT THIS ADDRESS

600x16 55.45	670x15 35.85	710x15 50.45	760x16 57.35
680x15 5.45	700x15 5.45	750x16 10.95	820x15 7.35
650x16 5.65	700x16 7.25	760x15 6.65	670x16 6.45
640x15 5.65	550x17 5.85	475x19 5.65	550x18 5.65

400x20 59.95	32x6-11.0 12.26	1000x20 19.95
650x20 11.55	750x16(8) 12.05	1100x20 22.95
700x20 12.35	825x20 20.55	1000x22 22.95
750x20 14.25	900x20 19.35	1100x22 23.95

Thousands of tires shipped all over U. S. A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. 2.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

STOP FALLING HAIR

Explained in Free Literature
 Anyone desiring booklet on hair growth and scalp trouble may obtain a free copy by writing

LANOLE SCALP CLINIC
 12810 Hickory Street Detroit 5, Michigan

YOU'LL CATCH BIGGER FISH

and have more fun catching them after you read Popular Mechanics HOW TO TEMPT A FISH. Here is the experience of veteran guides and fishermen brought to you for hours of enjoyable reading. Many pages of brilliant full color kodachrome plates. Covers every phase and style of fishing—even tells where to find the big ones and what baits to use. Hundreds of kinks and tips to make every trip more enjoyable. Endorsed by leading sportsmen throughout the country. 128 pages. 535 illus.



POPULAR MECHANICS PRESS \$2.00
 200 E. Ontario Street, Chicago 11



Build it Yourself!

TRAILER COACHES

Complete Trailer Book and Construction Data for 10, 16 and 22 Foot Trailers — Only \$1.50

Here's everything you want to know about trailers, with plenty of pictures and plans and instructions for building three different types. Covers also, history of trailers, trailer parks, camps and overnight-stops information, furniture, furnishings, materials and engineering data. If you want to build a trailer, live in a trailer, or just want to know more about trailers, get this book. Only \$1.50 postpaid. Rush order to:

Partial Contents
 Trailer Parks—Living in a Trailer—Towing a Trailer—Floor Plans—Service—Classifications—Balance—Dollies—Jacks—Weight Distribution—Construction—Working Drawings for a Two-Place, Standard Travel and Standard Dwelling Trailers. Size 8 1/2 x 11 1/4 inches.

POPULAR MECHANICS PRESS Dept. 350, 200 E. Ontario St., Chicago

SEND ME

every month so I am sure to see each new issue. Here's

\$3.50 for 1 year
 \$8.00 for 3 years

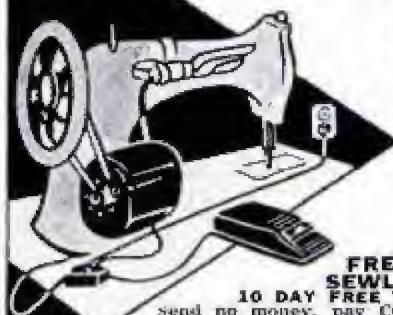
name _____

address _____

city _____ zone _____ state _____

Send this order to your newsdealer or send it to
POPULAR MECHANICS
 200 East Ontario St. Chicago 11, Ill.

ELECTRIFY your SEWING MACHINE



NEW LOW PRICE!
\$10.50 1 YR. GUARANTEE

Buy direct from manufacturer and save! Kit comes fully wired, installed in a jiffy! Fits all machines! You get these all-new parts:

- Motor & Bracket
- AC-DC 115v 60c
- Multi-speed foot control
- Cord set & block
- Easy instructions
- Steel pulley & belt

FREE . . . reg. \$2.95 chrome SEW-LITE given with every kit.

10 DAY FREE TRIAL — ORDER NOW!

Send no money, pay COD or send money order and we'll pay postage. Please state whether wheel on your machine turns toward you or away from you. Shipping wt. 6 lbs.

SENIOR SEWING MACHINE CO.

197 CLIFTON PLACE Dept. PM-37 BKLYN, N. Y.

AMAZING NEW SAFE SAW MOST POWERFUL OF ITS KIND



CUTS 1" WOOD, thin metal, plastic! New "201" Syncro QUIET for apartment use, SAFE for kids, POWERFUL for Dad's use. Any length cuts. Stroke adjustable. Portable. COMPLETE.

SYNCR0 Electric Jig Saw

with BUILT-IN Motor, \$22.95 at dealers or postpaid. Free Circular. SYNCRO Corporation, Dept. D-52, Oxford, Michigan.

NEW 1 1/2 H.P. MOTORS \$59.50

REGULAR PRICE \$110.00. Small surplus stock due to material curtailment, 115-230 volt, single phase, heavy duty, 3450 R.P.M., ball bearing, capacitor motor with thermal overload. Suitable for vertical or horizontal mounting. Ideal for workshops, power tools, pumps, compressors, elevators, etc. Made and guaranteed by leading Mfr. Send check or money order and we pay shipping charges.

EARL OLSON, MFRS. REPRESENTATIVE
325 S. Cedar Lake Road, Minneapolis, Minn.

Catalog of 3000 Novelties 10c

Send 10c for amazing catalog of novelties, live animals, scientific supplies, hobbies, funmakers, planes & boats, looms, magic bricks, joke articles, unusual seeds, gadgets, get timeavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, auto & bike accessories, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, books, games, plants, etc. Send name, address & 10c to: **JOHNSON SMITH & CO., Dept. 492, Detroit 7, Michigan**

FREE CATALOG

Over 300 books on Fishing, Hunting, Home Repairs and Improvements, Bricklaying, Welding, Home Workshop, Power Tools, Hobbies, Crafts, Home Building, Trades, Making Money at Home, Furniture Making, Woodworking, Carving, Photography, Art, Drawing, Mechanisms, Engineering, Refrigeration, Plumbing, Radio-TV, Electricity, Automobiles, Farming, Livestock, Gardening, Decorating, Painting, many, many more. Send for yours today.

POPULAR MECHANICS PRESS, 200 E. Ontario St., Chicago 11

WEBSTER-VM-G.I. 3-SPEED RECORD CHANGERS

General instruments. Brand new. Fully automatic. Plays all size records — 7", 10", 12". OUR PRICE \$47.50 Net. 12"x12 3/4" Long Life needle included.

\$15.95 IMMEDIATE DELIV.



ORDER YOURS TODAY. Comes with RCA plug to attach to your radio or T.V. set. Full guarantee. Original factory cartons.

REPLACE YOUR OLD CHANGER NOW!
3 tube amplifier, 5" speaker, volume and tone controls with eyes. Ready to operate. Same as used in portable units. . . . \$8.95
VM #950 Webster #100 \$22.95
Flip Cart. \$22.95 Flip Crystal Cart. \$23.95

WEBSTER 100 With G.E. Triple-Play Reluctance Cart. . . . \$29.95
Pre-Amp with tube \$4.95 Metal Base for above changers. \$3.50
High Fidelity FM-AM Chassis Complete, Ready to Operate \$69.50

Please enclose shipping charges. Order direct from this ad.
JAN ELECTRONIC DIST. CO. 218 FULTON STREET, N.Y.C. 7
Dept. M.O., WO. 4-0632

NEW smarter way to check your engine's performance!



NEW!

Stewart-Warner MOTOR MINDER

Spots motor trouble as you drive! Motor Minder uses vacuum gauge mechanism . . . helps you get peak performance from your engine. Shows condition of carburetor, valves, timing, piston rings, manifold, etc., at all times. Handsome, easy-to-read dial. Illuminated for night driving. Easy installation. Only \$10.95. At your dealer. Or write:

STEWART-WARNER

Instrument Division, Dept. N-52
1850 Diversey Parkway • Chicago 14, Ill.

ONLY WOLVERINE WORK SHOES

Have Triple-Tanned Shell Horsehide



YES—that's true!
But it's not ordinary shell horsehide in Wolverines. It's triple-tanned by a secret process to give you moccasin comfort in work shoes, yet retains all its natural toughness to give you amazing extra wear at a saving. Ask your dealer.

FREE . . . Wolverine Vu-Riter

Who is your dealer? Just drop us a postcard and we'll be glad to tell you. In addition, we'll send you a genuine *Wolverine Vu-Riter*—the ball-point pen sensation everybody wants. Address:

WOLVERINE, Box UG-5, Rockford, Mich.



"I COULDN'T GET ALONG WITHOUT MY MEZURALL TAPE RULE — IT'S MY HANDIEST TOOL . . ."

LUFKIN
CHROME-CLAD
MEZURALL



177

"My Mezurall with its adjustable hook gives me accurate inside measurements. It also measures odd shapes, as well as butt end and hook-over measurements. The jet-black markings are easy to read against the durable chrome white background which will not crack, chip, or peel. I can replace blades in a matter of seconds. You can get them in 6, 8, and 10 foot lengths."

BUY **LUFKIN**

TAPES • RULES • PRECISION TOOLS
AT YOUR HARDWARE OR TOOL STORE
THE LUFKIN RULE CO., SAGINAW, MICHIGAN
132-138 Lafayette St., New York City • Barrie, Ont.

The Cleanest, Coolest Shaves of Your Life!
Brand-New, Precision-Made A.C.
ELECTRIC RAZOR



Only
\$4.95

DOUBLY
GUARANTEED!

TRY IT—without risking 1c—
for 30 DAYS ON YOUR OWN BEARD!

Say "goodbye and good riddance" to old-fashioned shaving methods! Start shaving the **STERLING ELECTRIC** way and enjoy the cleanest, coolest, smoothest, most-comfortable shaves of your life. Toughest whiskers come off clean as a whistle . . . and **FAST!** The **STERLING** moves "em down like magic! Yes, here's every advantage of electric shaving at an incredible low price . . . only \$4.95 complete. You'll save the entire low cost in a few months in blades and shaving cream *you don't buy!* Not a toy, not a gadget. Far from it! Precision-made. Looks, handles, performs like razors costing 3, 4 and 5 times more! Look at these "expensive razor" features:

- 4 precision shaving heads!
- Hollow-ground cutting blades
- Blades honed in special diamond-honing compound!
- **AND MORE!** Handsome white plastic case, 6 ft. extension cord, self-starting, self-sharpening, self-lubricating . . . all for the incredible low \$4.95 price . . . and **DOUBLY GUARANTEED!**
- Automatic safety guide-bar.
- Powerful 60-cycle motor.
- Cutting blades chrome plated for lifetime service.

YOU DON'T RISK A PENNY TO TRY IT!

Make us prove it! Send for the Sterling today. When it arrives use it on your own beard for 30 days. If you don't agree that the Sterling is the shaving value of all time, return it for an immediate, no-questions-asked refund. If you keep it, you're protected for **ONE YEAR** by our written guarantee against mechanical defect. Rush your order. Quantities limited. Send only \$1.00. Pay postman \$3.95 plus 70c postage on delivery. Or send \$4.95 with order and we ship postage paid! **LADIES—NOTE:** the Sterling shaves underarms, legs smooth and fast. You'll love it!

MODERN MERCHANDISE CO.

169 W. Madison St., Dept. 639, Chicago 2, Ill.

SAVE GAS

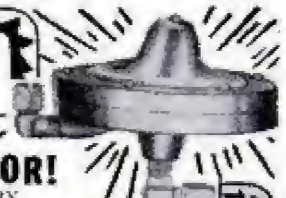
WITH A FUEL PRESSURE REGULATOR!

THIS REVOLUTIONARY NEW ACCESSORY STOPS GAS WASTE CAUSED BY FUEL PUMP PULSATION. ELIMINATES CARBURETOR FLOODING AND FUEL "SURGE," STOPS THE ANNOYANCE AND POWER LOSS CAUSED BY "MOTOR CUT-OUT." Many users claim up to 25% gas saved. Regulator s-m-o-g-l-h-s fuel flow . . . prevents vapor lock and percolating.

It pays for itself in a few weeks with gas saved, by eliminating frequent carburetor tuning and by reducing engine and carburetor wear. Fits all cars and trucks.

3 BOOKS FREE
With each order: Big Speed Equipment Catalog plus "Economy Driving Manual" plus famous "160 Miles Per Gallon Book"—a regular \$1.75 value free with order.

NEWHOUSE AUTOMOTIVE INDUSTRIES
Dept. RR-5, 5905 E. BEVERLY BLVD., LOS ANGELES 22, CALIF.



BEFORE AFTER
Only **\$5.95** post-paid
(or send \$1. balance C.O.D.)
plus famous "160 Miles Per Gallon Book"—a regular \$1.75 value free with order.

Make Your Own LOW COST POWER TOOLS

Use Wood, Scrap, Discarded Materials—Make Practical, Proven Machines

Order today the new "Forty Power Tools You Can Make." Even though you have the older edition, get this new book with twenty brand new tools — 40 in all. Make your own motorized lathe, drill press, sander, shaper, circular, hand, scroll and jig saws from old auto and other discarded parts. Make forty different tools following simple instructions, diagrams and photos and have an efficient, up-to-date shop. Save money, time and hard work and do a better job with low-cost power tools. Sent post-paid for only \$1.50 with order. Avoid high C. O. D. charges.



POPULAR MECHANICS PRESS
200 E. ONTARIO ST., CHICAGO 11, ILLINOIS

NEW POPULAR MECHANICS MAGAZINE LIBRARY FILE

Brand New, Grand New Way to Preserve Each and Every Issue of Popular Mechanics

Now you can preserve every treasured issue of Popular Mechanics in these ingenious, custom-built storage files. Constructed to look like an attractively bound book, Popular Mechanics Magazine Library Files afford neat, orderly, Rick-of-the-finger convenience. Handy reference index printed on back records the exact location of selected articles, diagrams, etc. A "must" for every reader of Popular Mechanics Magazine. A sensational Popular Mechanics value scoop. Order yours today. Use the handy coupon.

Only
70c

PER SET OF 2
(set holds 12 issues)
POSTAGE PAID

5 sets only **\$3.10**

10 sets only **\$6.00**
POSTPAID

USE THIS COUPON . . . MAIL TODAY

Popular Mechanics Magazine, Dept. PL
200 East Ontario Street, Chicago 11, Illinois

Please rush PREPAID _____ set Popular Mechanics Magazine Library Files. (QUANTITY)

Remittance for \$ _____ is enclosed. (AMOUNT)

Name _____

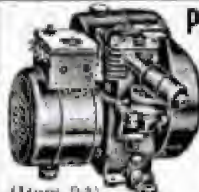
Address _____

City _____ Zone _____ State _____

BUY DIRECT

MASTER MECHANIC

UP TO 85% DISC.



Portable LIGHT PLANT

PUSH BUTTON START
500-700 watts 110-120 v. — 60 cyc. A.C. Powered by a steady dependable, easy starting, air-cooled 1 1/2 hp. gas engine. No wiring necessary, just plug in and operate. Plenty of current for any oil burner, freezer, brooder, pump, emergency lights, etc. which require up to 700 watts. Ideal for Civil Defense, Fire Dept., trailers & camps. Complete with Voltmeter and built-in winding to change 8 v. auto batteries. Wt. 85 lbs. Fully guaranteed. Be prepared if war or storm knocks out power lines.

Reg. \$275.00 value \$143.50
700-800 Watt Plant (Item 44) \$169.95
Same as above but greater output.
1000-1200 Watt Plant (Item 45) same as Item 24, but larger generator & engine \$199.50

GIANT 2000-2500 WATT PLANT

(Item 31) 110-120 V. 60 cyc. A.C. Absolutely the best made—exclusive dynamically balanced armature; heavy windings develop up to 5000 watt overload for motor starting. Skid-mounted portable. Powered by easy starting Briggs or 6 hp. Wisconsin engine—complete with all accessories; engine easily disconnected for other uses. Big outlet box, voltmeter, no wiring necessary. Ample current for all purposes. Factory warranty and instructions included. Wt. 320 lbs. Reg. \$589.00. Special at \$299.50

With Electric Self Starter (Item 179) \$359.50

GENERATOR ONLY and control box. \$169.50

Drive it with your engine or tractor.

TRANSFORMERS—(Item 107) Convert 110 v. A.C. to 220 v. Capacity 2 kva. Simple hook-up. Regularly \$55. Our price—when purchased with light plant. \$27.50

Purchased separately \$34.50.

3000-3500 WATT PLANT

(Item 108) Wm. eng., push button starter. 110-120 v. — 60 cyc. A. C. heavy duty for continuous or standby use. \$439.50
(Wt. 370 lbs.)

HI-LINE 6000 WATT PLANT

(Item 102) Push Button Start, 110-230 v., 60 cycle A. C. A brute of a power plant with a rugged 12 hp. Wisconsin engine. Plenty of electricity for ranges, water heaters, freezers, pumps, machinery, etc. Affords both 110 and 230 volt. 1 deal where heavy current is needed. Wt. 590 lbs. Easily worth \$995.00. With self starter. \$645.00
Factory Spec.

Generator and control box only, belt driven. Use your engine or tractor. \$345.00
Wt. 240 lbs.

Buy Wholesale—Direct From Factory—World's Largest Direct Sellers of Light Plants.

You can pay more — but you can't buy better

MALL ELECTRIC CHAIN SAWS

Amazing labor saver. Falls and cuts up 30" trees in minutes. Wonderful for pruning and trimming. Use portable light plant for power. Item 202, 1 1/2" Saw Wt. 12 lbs. \$45.00
Item 203, 1 1/2" Saw Wt. 20 lbs. \$130.00

IMMEDIATE DELIVERY—ALL ITEMS

HEAVY DUTY D-C ARC WELDER



Use as portable or shop welder. Up to 300 amps. Senior model. Made for years of trouble-free, continuous service. Will handle light or heavy jobs. Easily welds up to 3/8" plate using 1/2" rods. Built-in air-cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hit-to-switch and dial control gives wide range of welding heats. Run welder at 2500 rpm. with tractor, loop or 1 1/2 hp. gas engine, or a hp. elec. motor. Complete with instructions, guard, and double V belt or flat pulley. You can pay more, but you can't buy a better welder. Wt. 110 lbs. \$400 value at \$99.75

DUAL CONTROL MODEL same as above but with built-in dual rheostat for low heat for soldering, brazing, welding. Spec. \$119.50

WELDING KIT. Two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at \$10.50

EXTENSION CORD

(Item 16) 46 ft. heavy duty, made of specially insulated No. 14 2-conductor wire. So tough that you can drive over it and yet flexible and easy to handle. Resists oil, grease or water, extends electricity up to 400 ft. without voltage drop. Use indoors or out. Complete with heavy rubber plug and outlet. Wt. 2 1/2 lbs. Usually \$4.50—Special 40 ft. \$1.99

Comb: 2-40 ft. and 1-20 ft. (total 100 ft.) \$4.95
100 foot length (one piece) \$4.85

WIRE ONLY (Item 50) No fittings, 100 ft. \$4.00

HEAVY DUTY POWER CABLE

#12-3 Cond.—stranded, very flexible, rubber covered, special outside coat, for grounding power tools, etc. Finest heavy duty power cable made. U.S. Surplus. \$6.95
50 ft. (Wt. 8 lbs.) Item 199 \$12.95
100 ft. (Wt. 16 lbs.) Item 200 \$19.50

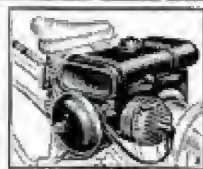
POTTERS WHEEL

(Item 47) Complete prof. equip. for making finest ceramics and pottery. New design, bronze, non-breakable. Atomic bearings. Large dynamically balanced cast-aluminum reversible bearings. Speed drive 1/8 to 1/2 rpm controlled by foot-pedal. Built-in adjustable arm rests, water cup and wedging wire. 18x18" enclosed throwing table—ample area for largest pieces. Item 34 hp. motor (not incl.). Complete with pulleys, belts and instructions. Wt. 26 lbs. \$145 value at \$59.95
Westinghouse 1/4 hp. motor \$19.50
for above.

SAVE ON CATALOG ITEMS

We have hundreds of bargains. Send 10c for catalog for information on following items: Variable Speed Selectors, Trouble Lights, Air Tanks, Fire Extinguishers, Electric Hot Water Htrs., Rubber Hose, Electric Tools, A.C. Arc Welders, Heating & Ventil. Fans, Potters Wheels, Paint Sprayers, Sleeping Bags and many, many other useful articles.

COMMANDO BIKE MOTOR



(Item 90)
New, super-modern 1952 model. This job is the Cadillac of all bike motors. Sensational Auto-Clutch prevents killing motor at each stop. Also selects proper ratio on hills. Mounts behind and drives rear wheel with Dynator. Free Wheeling lever permits pedaling if desired. Rear Mounting eliminates fumes, heat, dirt, and hant spewing. Easily installed in 15 minutes with home tools. Sturdy, crash-free, easy starting, light weight. Airframe type engine; up to 150 miles per gallon. Fully guaranteed for fun or profit. Ideal for deliveries, paper routes, messenger service, etc. Title to work and save. Dealer inquiries invited. The Commando Captain. \$99.75
1 cylinder 1 1/2 hp. \$125.00
The Commando General \$125.00
2 cylinder 3 hp. (Item 91) \$125.00
All Commandos shipped prepaid in U.S.

HEATING & VENTILATING FAN

(Item 10) Easily installed in furnace pipes. Forces even heat to all rooms. Over range, removes kitchen smoke and odors. Powerful continuous duty motor. 110-120 v. A.C. Quiet, super efficient fan moves huge volumes of air (300 to 600 c.f.m.) 8" Fan, wt. 5 lb. \$6.35; 9" Fan, wt. 6 lbs. \$7.45; 10" Fan, wt. 7 lb. \$8.45; 12" Fan, wt. 8 lbs. \$9.45.



32 pc. SOCKET SET

32-pc. Socket Set (Item 20) Highest quality grade, non-breakable sockets made by HUSKY. Beautiful, matched chrome alloy, absolutely the best. Complete range of 21 sockets from 1/4" thru 7/16" in 1/4" drive and 7/16" thru 1-1/16" in 1/2" drive; 2 extensions, reversible 1/2" ratchet, adaptor bit, slide head, all angle coupling, 2 end wrenches, 1/4" speeder handle and sturdy metal tool box. For prof. mechanics who want the best. Wt. 14 lbs. Easily worth \$41.50. While they last \$16.95



3" DRIVE 15 PC. SOCKET SET (Item 201) Same top qual. as above—includes 7 sockets 3/4" thru 3/4", reversible ratchet, extension, flex. handle, cross bar, 3 punches, metal tool box. 5 lbs. List \$9.95
Price \$18.96. Our Spec. \$9.95

DUAL TUBE LIFE SAVERS

(Item 54) NEW APPROVED TYPE made by Genl. Tire Co. Navy. Each has 2 rubber tubes for double protection. Easily inflated by mouth to 55 in. Wear one around waist as comfortable life saver. Adjustable safety buckles fit adults or children. Fits several together for raft or big luxurious mattress. Invaluable on boats or beach. Wt. 2 lbs. each. Our spec. is fraction of cost! 99¢ each, 6 for \$5



MANUFACTURERS AND JOBBERS — Write us about your surplus items

All items brand new. Prices f.o.b. Chicago area. 10 day Money back guarantee. Send check or M. O. MASTER MECHANIC MFG. CO., DEPT. 53A Burlington, Wis.

SELL GOLD & SILVER WINDOW LETTERS

300% PROFIT! Fast, easy sales to stores, offices, doctors, lawyers, etc. Individual orders for merchants interested in saving \$555 doing their own window lettering. Letters easily applied on glass, wood, metal with varnish-gline (not water). Want to sell? Write for samples. Write for samples. METALLIC SIGN CO., 430 N. Clark St., Chicago 10, Ill.

SAY YOU SAW IT IN POPULAR MECHANICS

GARDEN TRACTORS



SPEEDEX
YOUR CHOICE OF TWO TYPES
8 H.P. RIDING
2 1/2 H.P. WALKING

Exceptionally Low Prices Still in Effect

New catalog gives you full details on the famous Speedex. Illustrates many labor-saving uses. Complete descriptions.

SEND POSTCARD FOR YOUR FREE COPY OF NEW CATALOG TODAY

SPEEDEX GARDEN TRACTOR CO.

Box 216-E1D RAVENNA, OHIO

P-251-22

AIR COMPRESSORS

Portable 2-Cyl. Piston Type WESTINGHOUSE

Reg. \$60.50 **24.50**

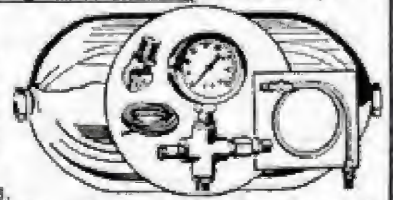
Model T-1 Complete

Brand new surplus special at an amazing low price. Westinghouse double-piston type 6.54 CFM volume, 2" bore, 1 1/2" stroke. Runs off power take-off or 3/4-hp motor equipped with the V-type direct-drive pulley and belt. For farm, home, industry, painters. Instructions and parts manual included. Send check or money order (parcel post, weight 23 lbs.). A complete line of genuine Westinghouse spare parts.

AIR HOSE—To fit, 25-ft. length with fittings & chuck \$4

PRESSURE TANK ASSEMBLY . . \$10.95

6"x24" steel tank 400-lb. test, two 3/4" openings, complete including air gauge, 20-ft. hose with fittings, relief valve, 4-way cross, nipples, copper tubing & brass fittings for connecting to compressor. Shipping weight 15 lbs.



NATIONAL EQUIPMENT CO. Westinghouse Ave. Dept. B — Wilmerding, Pennsylvania —

**SHARPEN
GARDEN
SHEARS...**



THIS EASY WAY

Crystolon® round edge slip MJS-15

● Pruning is easy with sharp shears, and sharpening a pair of shears is easy with a CRYSTOLON slipstone. This hard, sharp abrasive stone is tapered to reach the space between blades. Its round edges make it valuable for other tools in home and shop. MJS-15 is only 95c at better hardware stores or direct.

The "KNOW-HOW" on all garden, shop and household tools is in the "HOW TO SHARPEN BOOK"—32 illustrated pages that take all the mystery out of sharpening.

For your copy, send 10c to Dept. PM-5



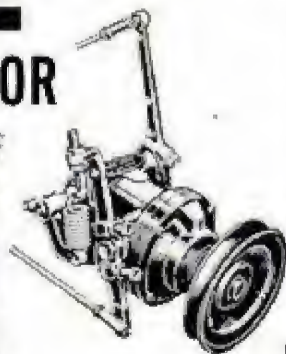
BEHR-MANNING

© Division Norton Co., Troy, N. Y.

Coated Abrasives, Sharpening Stones, Masking Tapes

this **ONE**
GOVERNOR

fits ALL popular
farm & industrial
gasoline engines



PIERCE LONG RANGE
Universal Governor

● Instant variable speed selection and accurate engine control at any speed setting within 1200 to 2600 RPM. Higher and lower ranges obtainable by simple change of pulley. Also "constant speed" operation.

● Accurate, dependable speed control for engines operating corn shellers, drag lines, hoists, arc welders, trucks and tractors with power take-offs, etc.

Write for Complete Information

**DEALERSHIPS
AVAILABLE**

"World's Most
Experienced Governor
Manufacturer"

**THE PIERCE
GOVERNOR CO., Inc.**
1700 Ohio Avenue, Box 1000
Anderson, Indiana, U. S. A.

**ONLY
\$44.00**

Send
Check or
Money Order.
State Make,
Model of Engine

EASY TO WORK WITH!

**FOAM
RUBBER**

**DO IT YOURSELF AND
SAVE 50%!**



Your money back if you aren't satisfied, with the perfect Foam Rubber! Re-cushion chairs, make your own pillows, mattresses, chair-pads, cushions! You'll save up to 50%—because you buy direct! **SEND FOR FREE PRICE LIST.** No C.O.D. Add 10% for postage and handling.



16 x 16 x 1 1/2"	\$1.30
16 x 20 x 1 1/2"	1.65
18 x 24 x 1 1/2"	2.00
24 x 24 x 1"	2.60
24 x 60 x 1/2"	4.30

All sizes approximate

ADAMS FOAM RUBBER
5611 Broadway • Chicago 40, Ill.

DEPT.
PMS

V-PLEX AUTOMATIC CLUTCHES

● Get smooth pickup for your power mower, motor scooter or garden tractor . . . with only throttle control. Prevent stalling engine, cut belt wear, permit no-load idling. Easily installed on 1/2", 3/4", 3/8" gas engine shafts. Factory-tested. See dealer or write for folder. PMS.



V-PLEX CLUTCH DIVISION — Hagerstown, Indiana

WALKIE TALKIES! — \$4.99 COMPLETE SET OF 2

POCKET SIZE — ELECTRONIC VOICE POWERED
No tubes, batteries, adjustments. Guaranteed to work anywhere up to 1/4 mile with extra wire. Swell for room to room—garage to house, etc. Your own private, talk-listen phone. Not war surplus. Brand new. Guaranteed. Two complete units with interconnecting wire — **READY TO USE!**

SEND \$1.00 deposit and pay postman \$3.99 plus postage charges or send \$4.99 for postpaid delivery. Available only by mail from **MIDWAY COMPANY, Dept. WPM-5, Kearney, Nebraska**

BURN WATER IN YOUR CAR

FREE LITERATURE ON REQUEST!
AGRICULTURAL DEPT. EXPERTS SAY WATER-ALCOHOL INJECTION BOOSTS MILEAGE!
Stop Ping! Improve mileage of all cars and trucks. Use regular gas with the new Octa-Gas water-alcohol injector. **WRITE TODAY!**
NEWHOUSE, Dept. 80-5, Los Angeles, Calif.
5805 E. Beverly Blvd.

HELPFUL BOOKS

Send post card asking for **FREE catalog**
Popular Mechanics Press, 200 E. Ontario, Dept. 601, Chicago 11

OVER 700% PROFIT!
WITH THE
PDQ CHAMPION PHOTOMASTER

Makes finished pictures in 2 minutes.
Takes and finishes 30 to 40 everlasting, black and white or sepia photos an hour. No dark room. Guaranteed not to fade. Photos taken on "SUPER SPEED" direct positive paper. Picture size 2 1/2 x 3 1/4 in. Complete, easy-to-operate portable photo studio. Size 4 1/2 x 5 x 10. Wt. 6 lbs. **700% PROFIT.** Write quick, get details about the great **PDQ CHAMPION PHOTOMASTER.**

P D Q CAMERA CO.
1161 N. CLEVELAND AVE. Dept. PM-5 CHICAGO 10, ILL.

The BIG 3 - Wellworth COMPRESSORS 1 YEAR GUARANTEE

FEATURES: 2 compression and one oil ring, aluminum alloy connecting rod. Stainless steel valves with brass seats and retainers. Cool-flo cylinder head, spray mist lubrication to every moving part. V-groove fly wheel.



Model W800

2" bore, 1 3/4" stroke, 2 to 3.8 c.f.m. up to 150 lbs. pressure. Operates with 1/4 or 1/2 HP motor

\$20.50

Shipping wt. 16 lbs.

Model W3

2 1/8" x 2", 2.55 to 4.80 c.f.m. up to 150 lb. pressure. Operates with 1/2 - 3/4 - 1 HP motor.

\$27.95

Shipping wt. 24 lbs.

Model W7

2 cylinder 2 1/8" x 2", 5.10 to 8.50 c.f.m. up to 150 lb. pressure. Operates with 3/4 - 1 - 1 1/2 HP motor.

\$54.50

Shipping wt. 45 lbs.

AIR REGULATOR and EXTRACTOR



1/4" Air Regulator. Gauge and filter. Wt. 5 lbs.

\$8.95

Regulator and Gauge only

1/2" Kidde Regulator & gauge. **\$12.50**
\$18.00 List



AIR TANK and Accessories

6" x 24" tank, air gauge and chuck, 20 ft. hose, pop-off valve, copper tubing with 4 brass flared fittings, 4 way cross, 3 nipples

\$12.45
TANK ONLY **\$6.25**

Same outfit as above with 12" x 24" stainless steel tank. 400 P.S.I.

TANK ONLY **\$14.50**



\$19.75

Wellworth BARGAINS ALL BRAND NEW EQUIPMENT at a GREAT SAVING!

LIGHT PLANTS & GENERATORS

\$275 Leland 2 1/2 to 3 KW generator, 135 lbs. \$225.00
2 to 2 1/2 KW light plant, wt. 180 lbs. \$365 list. Special **\$299.50**
Generator only, wt. 75 lbs. \$169.50
500 WATT GENERATOR, wt. 55 lbs. \$ 99.50
5000 to 6000 W. GENERATOR, 110/220V, Wt. 225 lbs. **\$325.00**
5000 W. LIGHT PLANT, 110/220V, 60 cy. Wt. 575 lbs. **\$645.00**



"Wellworth" BLOWER BARGAIN

Quiet operating. Double wheel inlet, double width blower. For heating, ventilating, cooling, air washing, exhausting and forced draft. **DIMENSIONS:** 10" wheel; outlet 13 1/4"x11 3/4"; inlet 8 3/4", Height 19". Width 18". Depth 16 1/2". C.F.M. 1/4" S.P. 1600; outlet vel. 1375.

Wt. 45 lbs.
BLOWER LESS MOTOR AND DRIVE \$27.50

With belt and variable speed pulleys, \$2.50 extra.
SAME BLOWER, COMPLETE WITH 1/4 H.P. MOTOR. \$45.00

WELLWORTH V-BELT CLUTCH



Takes starting load off engines or motors. When speed is reached, a flip of handle shifts clutch from idling to driving position. Handles "A" belts, 2.35" pitch diameter. 5/8" bore. Ideal for use with lawn mowers, garden tractors, home workshop motors, etc. 3 1/4" long. Safe, easy to mount, seated bronze bearings, positive action. Shpg. wt. 3 lbs.

BUSHING FOR 1/2" SHAFT 15c
\$7.50

SAME CLUTCH FURNISHED WITH 3/4" BORE \$8.50

AUTOMATIC COMPRESSOR UNIT

1/2 H.P. heavy duty capacitor motor. AC 110/220 volt, 60 cycle, 2x1 3/8 inch piston type compressor, splash feed lubrication. 12x24 inch tank, automatic pressure switch, CFM 2.8 at 100 lb. pressure, or 150 lbs. pressure for intermittent duty. Check valve, safety valve, air regulator with gauge and filter, 20 ft. air hose with air chuck for inflating tires. V. belt drive. Mounted on 2 wheels, ball bearing, with 2"x10" semi-pneumatic tires. Portable with handle. Shipping wt. 60 lbs.

With 1/2 h.p. motor **\$160 Value**
\$98.50

Less Motor **\$79.50**

With 1 1/2 h.p. gas engine **\$124.50**



BIG 3 SPRAY GUNS

Sold only by WELLWORTH



W20
Pressure feed. Internal atomizing. Fan, round and angle nozzles included. Qt. cup. Wt. 5 lbs. **\$7.50**

W103
External atomizing. Flat and round spray. Qt. cup. Maintains 35 to 40 lbs. at 2 to 4 c.f.m. working pressure. Filter built in handle. Wt. 6 lbs. **\$9.95**

W28
2-way. Internal & external mix. 4 nozzles, 2 fluid tips. Requires 2 to 4 C.F.M. at 30 to 50 lbs. pressure. Qt. Cup. Wt. 6 lbs. List \$18.50 - Only **\$12.95**



\$12.95

1/12 H. P. MOTOR

Delco 110 V. 60-cy. A. C. 1 phase 1750 r.p.m. 2 amps., will take 50% overload. Shaft 3/8"x1 1/4". Heavy duty, bronze sleeve bearing. Size 6" long, high, net wt. 12 lbs. List \$21.00. Special **\$13.50**



MERCURY CLUTCH

3" A-belt pulley. Centrifugal action for heavy loads. 5/8" bore. \$22.50 list. Special Price **\$9.95**



\$9.95



RED SEAL CONTINENTAL GAS ENGINE

1 1/2 HP with 6 to 1 reduction gear Operates at 450 R.P.M. For lawn mowers, scooters, garden tractors, pumps, compressors, generators, etc. List Price \$79.50. Shipping wt. 54 lbs. **SPECIAL PRICE. \$47.50**

PRICES F.O.B. CHICAGO. MONEY BACK GUARANTEE. SEND CHECK OR MONEY ORDER TODAY. PROMPT SHIPMENT. WRITE FOR OUR CATALOG. SEND 10c FOR POSTAGE.

WELLWORTH TRADING CO.

1832 S. Wabash Ave., Dept. D-552, Chicago 16, Ill.

Build the Best! EASY TO ASSEMBLE BOAT KITS



NEW CATALOG

OVER 40 PAGES, INCLUDES ALL YOU NEED TO BUILD YOUR OWN
1-BOAT KITS-30 MODELS
2-MARINE HARDWARE
3-MARINE ENGINES
4-MARINE CONVERSIONS
5-PAINTS & COLOR CHARTS

All For Only 35c,
SEND COIN TODAY

ROWBOATS

8-10-12-14 FT.
\$39 up



OUTBOARDS

8 Models 12 to 16 FT.



INBOARDS & CABIN CRUISERS

16 TO 23 FT.

NEW 18 FT. OUTBOARD CABIN CRUISER

FAST VEE BOTTOM HULL SPEEDS UP TO 25 M.P.H. — ROOMY CABIN, WITH TOILET, SLEEPS TWO —

U-MAK-IT PRODUCTS

703 P-WHITTIER ST., Bronx 59, N. Y. City



Schupack's AMAZING TOOL BARGAINS! ALL BRAND NEW MERCHANDISE

112 PIECE ASSORTMENT \$3.95
FOR ELECTRIC GRINDER
 \$10.00 VALUE - ONLY **3** Post-paid
 Here's what you get! Mounted Stones on $\frac{1}{4}$ " mandrel, Drum Sander, Sanding Sleeves for sander, Rotary Cutters, Wire Scratch Brush, Bristle Brushes, Circular Saw, Buffing Wheel, Grinding Wheel, Rubber Polishing Wheel, Cut-off Wheels, Rubber Cylinder, Mandrels to fit above tool, asst'd. Sanding Discs, Sharpening Stone, etc.

FLEXIBLE SHAFT - ONLY \$4.95 Post-paid
 Fits all electric drills & hand power tools. 35-45" long. Oilite bearings. Core of specially wound, high carbon steel wire in flexible steel casing. Will accommodate tool shafts up to $\frac{1}{4}$ " dia. For lathes, electric drills, etc.

SURPRISE VALUE 100 Pieces \$1.00 Post-paid
FOR ELECTRIC GRINDERS
 Grinding Wheels, Cut-off Wheels, Sanding Discs, Mounted Stones, Sharpening and Honing Stones, Rotary Cutting Burs, Abrasive Cartridges, Mandrels, and many other items.

2 DRUM SANDERS \$1.50 Post-paid
 With 12 Bands in Assorted Grits, $\frac{1}{2}$ " dia. x 1" long on $\frac{1}{4}$ " arbor with 12 bands

ONE DRUM, 1" DIA. X 1" LONG ON $\frac{1}{4}$ " ARBOR WITH 6 EXTRA SLEEVES \$1.00 Post-paid

18 ROTARY CUTTERS \$5.85 Post-paid
 \$13.50 Value
 Illustrated $\frac{1}{2}$ actual size
 Assorted sizes cutter on $\frac{1}{4}$ " or $\frac{3}{32}$ " shank. Will fit all hand grinders. Ideal for cutting wood, metal, or plastic. Brand new.

BUFFING WHEELS-5 for \$2.00 Post Paid U.S.A.
 8 inch diameter muslin wheels - $\frac{1}{2}$ inch thick. Ideal for coarse and fine polishing.

SCHUPACK SUPPLY CO., 7331 COTTAGE GROVE AVE., DEPT. M-30 CHICAGO 19, ILL. SEND CHECKS OR M. O. NO COD'S PLEASE

12 MOUNTED WHEELS and points on $\frac{1}{4}$ " Mandrel. \$2.95 Post-paid
 For grinding on plastic, wood soft and hard metals. Regular \$8.40 List Val. 12 wheels on $\frac{1}{4}$ " Mandrel \$3.60

12 MINIATURE CUTTERS \$1.00 Post-paid
FOR CUTTING WOOD, PLASTIC, or METAL
 Actual size. Ass't. shapes on $\frac{3}{32}$ " shank For die makers home workshop, etc.

ADAPTER CHUCK \$1.50 Post-paid
 With 2 interchangeable collets, opening from $\frac{3}{32}$ " to 0, on $\frac{1}{4}$ " mandrel. Price each only.

2 CIRCULAR SAWS \$1.50 Post-paid
ON 2 MANDRELS - ALL AT ONE LOW PRICE
 1" diameter saws on $\frac{1}{4}$ " Mandrels. For cutting wood, plastic, or soft metals. Order at once! Send Check or Money Order.

20 ABRASIVE ROLLS, \$1.00 Post-paid
 cloth, and $\frac{1}{8}$ " mandrel for grinding, sanding, deburring metal, plastic, wood or rubber, ONLY.....

7 HIGH SPEED TWIST DRILLS \$1.00 Post-paid
 15 DRILLS FOR ONLY \$2.00! Order Today!
 7 Popular Sizes - up to $\frac{1}{4}$ ". Brand new, ideal for home or shop use. Fits all standard chucks.

18 GRINDING WHEELS \$1.00 Post-paid
 and rubber polishing wheels up to 1" dia. For grinding & polishing metals, plastic, wood. With one $\frac{3}{32}$ " mandrel.

10 CUT-OFF WHEELS 1 $\frac{1}{2}$ " DIA. WITH $\frac{1}{4}$ " MANDREL \$1.00

NEW 1952 ILLUSTRATED CATALOG 10c.

MAGNETS OF ALL TYPES - 10c UP
 AMAZINGLY POWERFUL!
 $\frac{1}{2}$ lb. magnet lifts 25 lbs. \$1.05. Our leader. 1 lb. magnet lifts 40 lbs. \$2.05. Now also - will not weaken! Useful for lifting valuables from tanks, pipes, or rivers easily! 7 small magnets \$1.25 with list of many shop and home uses. Satisfaction guaranteed.
 R. EYRICH, 1219 W. MEINECKE AVE., MILWAUKEE, WIS.

For GARAGES-CAR DEALERS SERVICE STATIONS ...

Vibromatic
THE COMPRESSED AIR VACUUM CLEANER
 ● Cleans car floors, upholstery slick as a whistle—quick as a wink. A sensational low cost FREE SERVICE business builder. Attracts new customers... holds old ones. Thousands in use. Operates from any air outlet. Light as a feather, handy, fool-proof, trouble-free. Made and sold on full 10 day money back guarantee by the makers of world famous McAleer car polishes and rubbing compounds. Mail check for \$37.50 or shipped C. O. D.

McALEER MFG. COMPANY
 Dept. V-1 Rochester, Mich.
AGENTS: Write for our money making demonstrator deal. Every service station a prospect. Territories open.

Attaches to Your Present Air Outlet

Vibromatic CLEANER

\$37.50 Complete Prepaid

SHEET METAL BRAKES
 Forms angles, flanges and Pittsburgh locks. 26 gauge steel, heavier aluminum. Cam locking. Portable, can be bolted to bench, or clamped to edge of truck. All steel, reinforced. Shipped Exp. Coll. 30" size. Wt. 54 lbs., \$26.50. 36" Wt. 66 lbs. \$31.00. 48" Wt. 100 lbs. \$45.00. Floor mountings, portable, 32" high, 90 lbs. \$7.00. 12" BRAKE. Fits in visor to form difficult compound bends, up to 20 gauge steel. Not illustrated \$12.50 PP.

IRON BENDER, Forms hooks, angles, eyelets, etc. Capacity $\frac{1}{4}$ x12", or 5/16x1 $\frac{1}{2}$ ". 10 parts all steel \$10.00 Post P.

POWER CUT-OFF MACHINE cuts steel pipe and rods, and cuts grooves, notches, bevells, etc. up to 4-inches. Smooths longer pieces. Cut-off saw for wood, brick, tile, rock, and concrete. Size 15x15. Ball bearing arbor, uses $\frac{1}{4}$ HP motor \$28.50

Immediate Delivery. Order direct, cash, or C.O.D. or send for folder.
VYKE BRAKE CO., P-1116 So. 27th St., Omaha 5, Nebr.

AUTOMATIC RETOOTHING
MAKES NEW PROFITS
 for HAND SAWS

Cuts new teeth in 50 seconds - any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job.

WRITE DEPT. 5

BURR MFG. CO.
 8933 VENICE BLVD.
 LOS ANGELES 34, CALIFORNIA

VALUABLE BOOK
 Order Burr's Blue Book of Coast to Coast prices for saw shop services
25c

FOAM RUBBER

CORED
SLAB STOCK

Our tremendous surplus purchases enable us to offer you **FOAM RUBBER** in an amazing selection of sizes and shapes for your every need. Cushions, mattresses, pillows, cored and slab stock at less than wholesale.

WRITE FOR INFORMATION
Our **FABRICATING EXPERTS** will advise you. Foam rubber as low as **25¢ per square foot**.

MICROPHONE

Telephone type, highly sensitive with excellent, clear tone. This was the Signal Corps favorite. An ideal instrument for the radio "ham" and professional recording studio, broadcasting, home recording, public address, etc.

Complete with cord & plug... **329**

4WAY SWIVEL LAMP

Has 3 ft. flexible stand with 4 joints to adjust position. Can be used on 6-12-24-110 volts by changing the bulb. Ideal for gunsmith, workbench, desk, etc.

329

EYE LOUPES

An indispensable aid in fine inspection work. Available in 2 1/2, 3, 3 1/2, 4 & 5 power, each

99¢

7 PIECE DRAWING SET

A Real Palley BARGAIN! Has a 4 1/2" compass, with pen & pencil part, a 4 1/2" divider, a 3 1/2" reverse bow compass for pencil & ink, a 4 1/2" ruling pen, compass of extra leads. Complete in a velvet lined case. **ONLY 335**

EXACTOR HYDRAULIC REMOTE CONTROL MASTER & SLAVE

Consists of two units. Designed to operate controls on boats, machinery, engines, motors, etc. without need for rods, cables, pulleys, etc.

When connected with 1/4" tubing & filled with oil they act as a precision, remote controller. When Master handle is moved, Slave arm responds in exact motion. Range is 0 to 90 degrees.

Combination Master & Slave for **4250**
MASTER only - For an extra control... **2125**

HAND LINE

Rot-proof, weather resistant, hard linen line. Originally used as hand line in fishing for tuna, morlin, etc. Also has many uses around farm, factory, etc.

NEW in 300 ft. lengths. **169**

JUST OFF THE PRESS!

1952 CATALOG
230 PAGES
Fully Illustrated
1000's of **WAR SURPLUS**. Factory Close-Outs and General Merchandise Values.

For the mechanic, sportsman, hobbyist, home owner, etc. **BIG SAVINGS** on clothing, housewares, hardware, foam rubber, hand & power tools, outdoor equipment, plastics, gadgets & a huge stock of hydraulic supplies.

Send Only **50¢** (for handling & mailing)

1952 CATALOG
230 PAGES
Fully Illustrated
1000's of **WAR SURPLUS**. Factory Close-Outs and General Merchandise Values.

For the mechanic, sportsman, hobbyist, home owner, etc. **BIG SAVINGS** on clothing, housewares, hardware, foam rubber, hand & power tools, outdoor equipment, plastics, gadgets & a huge stock of hydraulic supplies.

Send Only **50¢** (for handling & mailing)

SAVE UP TO 85% IN WAR SURPLUS

2 WAY INTERCOM Made by DICTOGRAPH for convenient, 2-way conversation. Can be used anywhere, from room to room, house to house, office to stockroom etc. Carries sound as far as 500 ft. Operates on standard flashlight batteries - no tubes.

Has Alnico speakers, carbon microphone and switches. Unit consists of 2 complete stations (in orig. cartons) and approximately 25 ft. of wire. Complete instructions included.

BELL WIRE - for use with above - 100 ft. \$2.98
11.95 A \$17.50 VALUE

100% WOOL FILLED SLEEPING BAG

The bag with everything you desire in comfort & convenience. Square box construction. Outer covering is vat dyed, Forest Green, combed Zelon treated, poplin. Waterproof with heavy water lining. Insulated with weather-strip. Has detachable head flap and side closing. 100" Talon zipper. Double mattress pocket. Two bags may be zipped together. Overall size 36" x 80".

19.95
39.00 VALUE

NAVY Sealed Beam LAMP

U.S. NAVY portable search-spot light. Has pistol grip and aiming sight. Makes an ideal search, spot or emergency light for auto, boat, etc.

12V. light - 4" lens... **4.29**
24V. light - 4" lens... **4.79**

Set of 3 filters: red, green, amber (specify type lamp)... **.99¢**

SURPLUS WATERPROOF BOOTS NON-SKID

Assures complete foot and shoe protection in the coldest weather. Specially designed to keep the feet warm and comfortable & the shoes dry. Has 9 inch leather boot top, rubber shoe & sole with felt inner sole.

Reconditioned - in excellent condition. **5.95**
NEW 7.95

HUNTING KNIVES GENUINE G.I. EQUIPMENT

Has a 6 inch, polished Vanadium blade & Handle made of leather and fibre discs. Complete with tanned leather sheath. **Only 1.98**

7 x 35 BINOCULARS

The Very POPULAR CENTER FOCUS Model with Coated, Achromatic Lenses. Combines higher resolving power with extreme image brightness and amazing clarity. An IDEAL GLASS FOR ALL AROUND USE DAY or NIGHT! Has Lightweight, Precision made, Aluminum housing. Field of view is approx., 375 feet at 1000 yds. Complete with Leather Carrying Case and Neck Straps. **47.95** (PLUS FED. TAX)

7 x 50 PRISM BINOCULARS

Big, Powerful Lenses give maximum image brightness & needle-sharp vision. Individual eye focus. Wide field of view. With Leather Case and Straps. **33.95**

BRIDGE FRAME WINCH HOIST

Certified for Safety! Has 4 to 1 power ratio. Lifts up to 1500 lbs., on 1 line or has 6000 lbs., cap., on 5 lines.

Gears & ratchet are machine cut for precision & safety. Takes 135 ft. of 1/4" or 100 ft. 5/16" cable. **19.95**

SWIM FLIPPERS

Top quality rubber. Has pebble tread bottom. Adj. heel strap... Re-inforced for strength. Vented for air & drainage. Ideal for diving and swimming.

Med., Sizes: Small, Med., Large **7.95**

DIVING MASK

Soft rubber mask fits over eyes. Heavy duty glass shield. Adj. headband.

1 1/2" **2.59** 3" **2.69** 4 1/2" **3.95**

SNORKEL Breathing TUBES

Plastic with rubber mouthpiece. Allows breathing while eyes are underwater. Straight type **\$1.95**
CURVED TYPE - Has automatic seal when immersed **\$2.95**

NEW MAIL ADDRESS
2243 E. VERNON AVE.
Dept. PM-5
LOS ANGELES 58, CALIF.

SURPLUS MINE DETECTOR

A scientific "wizard" for discovering objects buried in dirt, sand, mud etc. Gives both sight & sound signal.

Unit consists of exploring rod with detector head, amplifier retractor and headset. Amplifier contains many valuable electronic and radio parts such as oscillator, tubes, antenna etc. Detector is battery operated, easily portable & comes with carrying case. Adaptable to many uses.

In radio & electronic research. **ONLY 4.95**

NAVY WADING SUIT

Makes surf and stream fishing a pleasurable Ideal for trappers, oil fields or any use where necessary to protect body or clothes from moisture, silt, muck etc. Made of rubberized canvas. Has vulcanized rubber gloves and boots. Sizes: Small, Med., Large. **7.95**

CONVERTED MODEL - Same as above

- Converted to waist length with bib & suspenders. **9.95**

16 POCKET VEST

The ideal jacket for the Rifleman or Hunter. Has 14 individual, outside pockets for shells, glasses & other accessories. 2 large (11" x 8") inner pockets, a leather holder for knife, gun or tool. Sturdy, yet lightweight with tie-straps at back for adjustable fit. **3.49**

LENZATIC COMPASS

Here is a precision compass of unusual accuracy & dependability. Has a prismatic, hair-line guide for sighting or distant object and at same time reading degree of setting. Needle is jewel mounted. Has luminous dial for night use and canvas carrying case. **NEW 3.95**

NYLON FISHLINE

STRONG - LIGHTWEIGHT - NYLON FISHING LINE. ROT-PROOF AND WATERPROOF...

1500 ft.	10 lb. Test	\$1.59
1000 ft.	25 lb. "	\$1.80
750 ft.	45 lb. "	\$3.25
750 ft.	50 lb. "	\$3.50
300 ft.	72 lb. Braided	\$3.79

AVIATORS (AH-4530) WINDPROOF & DUSTPROOF GOGGLES

Chamols lined, rubber covered frames. Inter-changeable, GROUND LENSES in clear or green. Has non-fogging breathers in frame. Adj. nose bar. Ideal for flying, cycling, etc. **NEW 3.25**

GO-1 GOGGLE KIT NEW! U.S. NAVY

Has soft sponge rubber frame, 2 Polaroid lenses, 2 green; 1 red; 1 clear. Perfect for racing, cycling, etc. **SPECIAL 89¢**

17 POWER TELESCOPE

A fine quality, IMPORTED instrument. Gives a bright, clear image with a wide field of view. An ideal telescope for all-around use. **ONLY 7.95**

Order From This Ad. Pay by M.O. or check. P.O.'s. acceptd. from D&B firms. Deposit with C.O.D.'s. All Prices FOB Los Angeles. All Sales Final.

PALLEY SUPPLY CO.

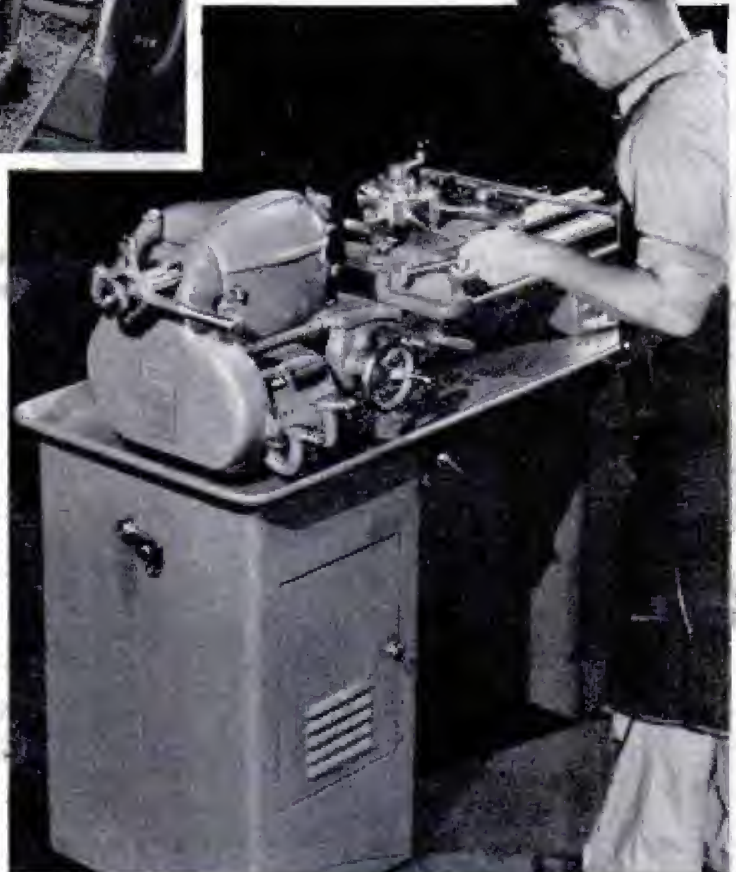
KEEP CLOSE-TOLERANCE MACHINING EFFICIENT!



South Bend PRECISION TURRET LATHES

South Bend 2-H Precision Turret Lathe—1" collet capacity, 16 1/4" swing, 96 power turret feeds, 48 cross slide feeds, 48 carriage feeds, 48 thread cutting feeds.

South Bend Precision Turret Lathes keep efficient the machining of small duplicate parts. Their remarkable accuracy and positive controls simplify the holding of close tolerances with only normal machine handling care. Finishes are commonly produced that otherwise would require additional operations. Simplicity of tooling makes job changes quick and economical. Wide ranges of power feeds and thread cutting feeds assure maximum efficiency on every job. They are particularly suited for second operations. Available in 3 sizes: 1" collet—16" swing; 1" collet—10" swing; 1/2" collet—9" swing.



South Bend CL930-Z Precision Turret Lathe—1/2" collet capacity, 9 1/4" swing, 48 carriage feeds, 48 thread cutting feeds, handlever cross slide, handlever turret.

SEND INFORMATION CHECKED:

TOOLS & ATTACHMENTS



9" and 10" BENCH LATHES



10" to 16-24" FLOOR LATHES



1/2" and 1" Collet TURRET LATHES



14" DRILL PRESSES



7" BENCH SHAPERS

Name _____ Company _____

Street _____ City & State _____

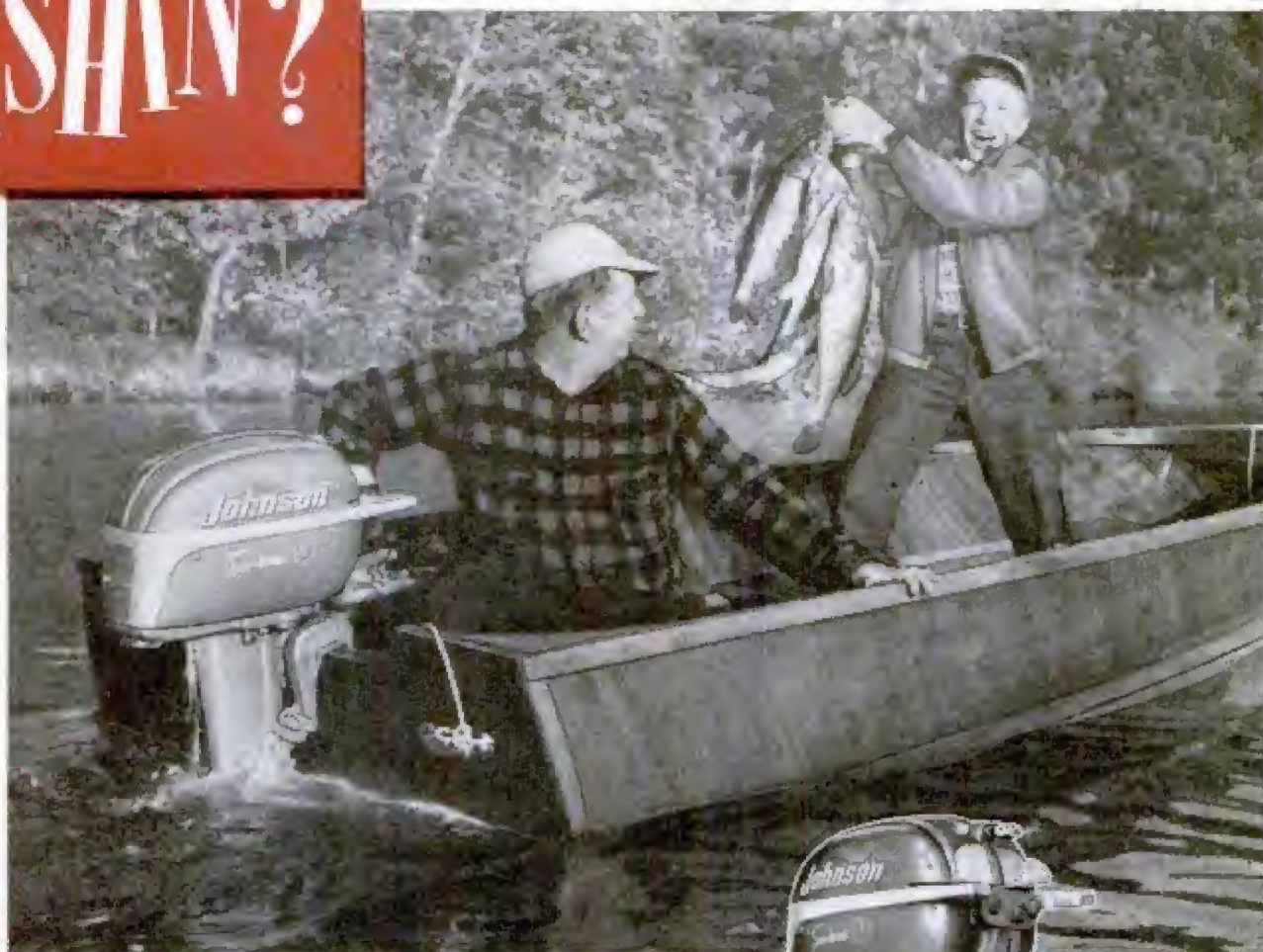
Building Better Tools Since 1906 • SOUTH BEND LATHE • South Bend 22, Indiana



GOIN' FISHIN'?

JOHNSON IS THE MOTOR!

More fishermen by far—76% more—own Johnson outboard motors than own any other make! You just can't beat Johnson's wonderfully smooth performance, extraordinary compactness, unbelievable stamina and world-famed **DEPENDABILITY**. See your Johnson Dealer. Look for his name under "Outboard Motors" in your classified phone book.



*It's a
Fact!*

YOUR DOLLAR BUYS MORE IN A JOHNSON

Compare and see! No other manufacturer has created so many important, patented outboard developments. When you own a Sea-Horse you have the latest and finest features. It's a fact . . . your dollar buys more in a Johnson.

FOR 1952 — 4 GREAT ALTERNATE FIRING TWINS

- SEA-HORSE 3: 3 hp. Less than 30 lbs. Patented Angle-matic Drive \$145.00*
- SEA-HORSE 5: 5 hp. Neutral Clutch. No shear pin. America's largest selling outboard motor \$187.50*
- SEA-HORSE 10: 10 hp. Gear Shift. Mile-Master Fuel Tank (6 gal.). Brilliant acceleration and performance \$295.00*
- SEA-HORSE 25: 25 hp. Gear Shift. Mile-Master Fuel Tank (6 gal.). Synchro Twist-Grip Speed Control. Sensational performance and value \$390.00*



SEA-HORSE
10

FREE! New Sea-Horse Handy Chart. Motors fully described. Write!
JOHNSON MOTORS
 400 Pershing Road,
 Waukegan, Illinois
*Johnson Motors of
 Canada, Peterborough*



OBC certified brake hp at 4000 rpm. *All prices f.o.b. factory, subject to change without notice.

Johnson

SEA-HORSES

FOR DEPENDABILITY





These baseball stars pick **Camels**

FOR FLAVOR
FOR MILDNESS



Ed Lopat Yankees 21-game winner has tried different cigarettes. Says Ed, "I picked Camels for mildness and flavor. No other cigarette gives me so much smoking pleasure!"



Early Wynn 20-game winner for the Indians is a Camel smoker, too. Early reports: "For steady smoking, my choice is Camels! They're mild and they taste great!"



Allie Reynolds Yankee pitcher of double "no-hit" fame. Allie stated, "I've smoked Camels a long time and I know how mild a cigarette can be! Camels taste great!"



"Preacher" Roe (22-3 in 1951) and other Dodgers—Carl Furillo, Clem Labine, Clyde King and Billy Cox—are Camel smokers. "We all agree on Camel mildness," says "Preach."

TEST FOR **MILDNESS**...TEST FOR **FLAVOR**...SEE WHY

CAMEL IS AMERICA'S
MOST POPULAR CIGARETTE
— BY BILLIONS!

Smoke Camels for 30 straight days. See how flavorful Camels are, pack after pack... See how mild Camels are, how well they agree with your throat as you steady smoke. You'll know why Camel is by far America's most popular cigarette!

R. J. Reynolds Tob. Co.,
Winston-Salem, N. C.



*Make your own sensible 30-Day
Camel Mildness test in your "T-Zone"
—T for Throat...T for Taste*

